



Final Supplemental

ENVIRONMENTAL IMPACT STATEMENT

FOR F-35 BEDDOWN AT EGLIN AIR FORCE BASE, FLORIDA

EXECUTIVE SUMMARY

JANUARY 2014

This volume contains the Executive Summary of the *Supplemental Environmental Impact Statement (SEIS) for F-35 Beddown at Eglin AFB, Florida*, and the entire SEIS on the CD in the pocket below. For your convenience, a list of acronyms is on the last page of this document.

To view the SEIS on the CD, you will need Adobe Acrobat® Reader. If you do not already have Adobe Acrobat® Reader, you can download it at no cost from www.adobe.com.

1. Insert the CD in your computer's CD drive and double-click on the file in the CD directory.
2. Either scroll through the document or click on a heading in the Table of Contents, which will take you to that section of the SEIS.

The CD files are read-only, which means you may view and/or print them. A printed copy of the SEIS is available at each of the following public libraries in Florida: Pensacola (Main Library), Crestview, Fort Walton Beach, Niceville, Northwest Florida State College, Panama City, and Valparaiso, and the public libraries in Hattiesburg, Mississippi (Main Library), Monroeville and Andalusia, Alabama, as well as Valdosta, Georgia. The SEIS is also available online at www.eglin.af.mil.

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EXECUTIVE SUMMARY

1. INTRODUCTION

In October 2008, Eglin Air Force Base (AFB) published the Final Environmental Impact Statement (FEIS) regarding the 2005 Base Realignment and Closure (BRAC) decisions for Eglin AFB. The decisions analyzed in the FEIS were: (1) Relocation of the Army 7th Special Forces Group (Airborne), or 7SFG(A), to Eglin AFB, Florida, from Fort Bragg, North Carolina; and (2) Standup of a Joint Strike Fighter (JSF) Initial Joint Training Site (IJTS) to train Air Force and Marine pilots and Naval aviators and maintenance personnel at Eglin AFB. Eglin AFB is required to accommodate JSF IJTS flight training requirements by providing airfields, access to regional airspace, ground support, and scheduling for training missions.

The DoD has selected the F-35 to be the next generation multi-role fighter aircraft for the Air Force, Navy, and Marine Corps. Total production of the JSF is expected to exceed 2,500 aircraft.

The Air Force's "Record of Decision (ROD), Implementation of Base Realignment and Closure (BRAC) 2005 Decisions for the JSF IJTS, Eglin AFB, Florida," dated February 5, 2009 (*Federal Register*, Volume 74, page 34, February 23, 2009) addressed the JSF IJTS and resulted in a decision to implement a portion of the JSF IJTS Alternative 1 presented in the *Proposed Implementation of the Base Realignment and Closure (BRAC) 2005 Decisions and Related Actions at Eglin AFB, FL Final Environmental Impact Statement* (FEIS). That decision included the delivery of 59 F-35 Primary Aerospace Vehicle Authorized (PAA) (previously known as "Primary Assigned Aircraft" and referred to as "F-35 aircraft" or "JSF aircraft" throughout this document), associated cantonment construction, and limited flight training operations from Eglin Main Base.

The February 2009 ROD required the Air Force to amend the local Eglin AFB flying instruction (Eglin AFB Instruction [EAFBI] 11-201, formerly known as the Air Armament Center Instruction [AACI] 11-201) to include JSF operations and the following guidance and limitations:

- Runway (RW) 12/30: This is the primary runway at Eglin Main Base for F-35 operations.
- RW 01: Limited F-35 operations will be allowed from RW 01, which, other than approaches and landings, includes only those flight operations necessary for emergencies, unplanned contingencies, and weather affecting aircraft performance limitations and requirements.

- RW 19: Limited F-35 operations will be allowed from RW 19, which, other than take-offs, includes only those flight operations necessary for emergencies, unplanned contingencies, and weather affecting aircraft performance limitations and requirements.

The February 2009 ROD also determined that preparing a Supplemental Environmental Impact Statement (SEIS) would further the purposes of the National Environmental Policy Act (NEPA).

This supplemental document addresses where the F-35 aircraft may ultimately bed down on the Eglin Reservation, how they might be operated, and the degree to which other mitigation measures are possible. The SEIS contains analyses of operational alternatives and mitigations for the 59 F-35 aircraft authorized to be delivered to Eglin AFB under the February 2009 ROD. The Air Force has analyzed a range of alternatives that would, among other things, maximize the number of flight training operations to be conducted on the Eglin Reservation, preserve restricted airspace to the greatest extent possible, and protect the military value of Eglin AFB as a Major Range Test Facility Base (MRTFB) to support all existing and future military missions.

The February 2009 ROD indicated that this SEIS would analyze the proposed beddown and operational alternatives for 48 additional Air Force F-35 PAA not authorized under that ROD. Prior to the SEIS development, the Air Force began evaluating the regional airspace and in particular the capacity for future Department of Defense (DoD) missions within the region. This regional airspace study was known as the Gulf Regional Airspace Strategic Initiative (GRASI) and based on 2009 preliminary modeling data from the GRASI study, the mission airspace configuration would not support more than 59 F-35 aircraft. It is believed that GRASI recommendations will assist in implementing a comprehensive strategy for airspace planning and ensure that the military value of the MRTFB for all Eglin customers is maintained. Based on those GRASI projections, the Air Force decided to limit the number of aircraft evaluated in the SEIS to 59 F-35 aircraft (i.e., one squadron each for the Air Force, Navy, and Marine Corps).

After the Draft SEIS was published in September 2010, the Joint Program Office (JPO) released new noise profiles for the F-35 aircraft; consequently, the Air Force delayed the release of the Final SEIS. Meanwhile, the final GRASI recommendations became available, plus the Air Education and Training Command (AETC) revised the operational plans for the aircraft to reflect updated JSF training plans. The Air Force has revised the Draft SEIS to address the updated noise profiles, the GRASI recommendations, and the revised operational plans. Section 1.2.6 provides a more detailed explanation of the updates and differences between the 2013 Revised Draft/Final SEIS and the Draft SEIS that was published in September 2010. The

analysis was conducted in accordance with NEPA requirements (42 United States Code [USC] 4321), the Council on Environmental Quality (CEQ) regulations (40 Code of Federal Regulations [CFR] Part 1500), and federal regulations for the Department of the Air Force Environmental Impact Analysis Process at 32 CFR 989, which addresses implementation of NEPA and directs officials to consider the environmental consequences of any proposal as part of the decision-making process. After considering the potential environmental impacts of the required JSF-related activities, the Air Force will decide whether to implement an action Alternative or the No Action Alternative.

As you review this Executive Summary, you will find shaded boxes such as this one summarizing public comments. For example, one scoping commenter expressed concerns regarding aircraft noise and asked whether it could be spread out among various airfields.

This Executive Summary presents information derived from the SEIS and is not meant to replace the SEIS. When appropriate, the Executive Summary refers the reader to the SEIS and its sections for more comprehensive information.

A Notice of Availability for the Draft SEIS was published in the *Federal Register* on September 24, 2010, with associated newspaper, radio, and television announcements. After public notification, three public hearings were held in October 2010 in the following Florida communities: Valparaiso (October 12), Niceville (October 13), and Crestview (October 14). A total of 76 members of the public and government agencies submitted approximately 400 comments to the Air Force during the public hearings and Draft SEIS comment period. The majority of public comments received during the Draft SEIS public review process expressed concerns regarding: the Preferred Alternative, impacts to residential property value and mitigation costs, encroachment, public health issues unrelated to aircraft noise, implementation of adaptive management, and aircraft noise and its impact on the public and human health.

Normally the Air Force responds to relevant substantive comments on a draft EIS or SEIS in the final EIS or SEIS, consistent with 40 CFR 1503.4; however, since a substantial number of comments were submitted on the 2010 Draft SEIS and public comments were solicited on the 2013 Revised Draft SEIS, the Air Force elected to summarize the substantive comments received on the 2010 Draft SEIS and provide Air Force responses in Section 1.4.4 of the SEIS. Appendix A, Volume II, provides copies of government agency comments on the 2010 Draft SEIS. Copies of agency and public comments received on the 2013 Revised Draft SEIS and the Air Force's responses to those substantive comments are presented in Appendix A, Volume III.

2. PURPOSE OF AND NEED FOR THE ACTION

The overarching purpose and need for the F-35 portion of the proposed action in the FEIS was to implement the BRAC 2005 program, as required by law, and establish the

JSF IJTS at Eglin AFB. The February 2009 ROD authorized the implementation of a portion of the FEIS's JSF IJTS Alternative 1 to meet the essential BRAC requirements to establish the academic training, the flying training, and logistical portions of the JSF IJTS at Eglin AFB. The ROD authorized delivery and limited operations of 59 F-35 PAA, as well as implementation of the BRAC and the Services' Military Construction (MILCON) related to installation support, operations and maintenance, and academic training requirements.

The primary purposes of the SEIS are as follows:

- To analyze the beddown location and operational alternatives and examine mitigations for the 59 F-35 PAA authorized for delivery by the February 2009 ROD (one squadron each for the Air Force, Navy, and Marine Corps), including the use of the Duke Field airfield and construction of a new runway(s) at Eglin Main Base
- To analyze additional alternatives addressing the proposed distribution of JSF flight operations, on and off the cantonment area, to allow efficient pilot training, de-conflict flying operations with other military and civilian operations, and reduce or avoid noise impacts on sensitive receptors

3. PROPOSED ACTION AND ALTERNATIVES

Three versions of the F-35 would train at Eglin. The Marine Corps variation pictured here is the F-35B, which is a short take-off and vertical landing (STOVL) aircraft.

The February 2009 ROD resulted in a decision to deliver three squadrons of F-35 aircraft (one squadron each for Air Force, Navy, and Marine Corps, for a total of 59 aircraft) and construct some supporting infrastructure at Eglin Main Base. The ROD also concluded that the JSF Academic Training Facility (known as the "JSF Integrated Training Center" in the FEIS) with dormitories, dining facilities, academic training classrooms, and simulators would be located at Eglin Main Base. The Proposed Action and Alternatives in the SEIS include beddown and flight training for the 59 F-35 aircraft without the limitations set forth in the February 2009 ROD. The decision to implement part of the JSF IJTS Alternative 1 does not in any way foreclose a reasonable beddown alternative from detailed analysis in the SEIS.

NEPA and its companion regulations require the Air Force to develop and identify reasonable alternatives to a proposed action. In determining the scope of alternatives to be considered, emphasis is placed on what is "reasonable." Reasonable alternatives include those "that are practical or feasible from the technical and economic standpoint

and using common sense, rather than simply desirable from the standpoint of the applicant" (CEQ, 2010).

The alternatives being considered on the Eglin Reservation require a primary operating base, or Main Operating Base, from which aircraft depart for training activities and terminate their training activities. The Main Operating Base is the location where the aircraft would be launched and recovered; where aircraft maintenance would occur; where the logistical support would be; and where the ramp for nighttime beddown would be.

Figure ES–1 illustrates potential airfields in the MRTFB that were evaluated. Initial screening analysis resulted in 18 candidate alternatives for JSF beddown grouped under one of three primary, or "anchor," locations that could support the Main Operating Base airfield requirements. The initially proposed anchor locations included Eglin Main Base, Duke Field, and Choctaw Field. The 18 candidate alternatives were presented to the public during the August 2009 public scoping meetings and are shown in Table ES–1.

Table ES–1. Candidate Alternatives Presented at SEIS Scoping Meetings

Anchor Alternative 1 – Eglin Main	
1A	No change to the existing runways; Duke and Choctaw auxiliary fields
1B	Adjust Runway 19 to 16; Duke and Choctaw auxiliary fields
1C	Expansion with parallel runways; Duke auxiliary field
1D	Expansion with parallel runways; Choctaw auxiliary field
1E	Expansion with parallel runway; Duke and Choctaw auxiliary fields
1F	Move Runway 19 threshold; Duke and Choctaw auxiliary fields
1G	Raise the Runway 19 IAP; Duke and Choctaw auxiliary fields
1H	Move Runway 19 south; Duke and Choctaw auxiliary fields
Anchor Alternative 2 – Duke Field	
2A	Parallel Runways and LHA; Choctaw auxiliary field
2B	Parallel Runways and LHA; Eglin 12 auxiliary field
2C	Parallel Runways and LHA; Eglin 12 and Choctaw auxiliary fields
2D	Single Runway; Eglin 12 and Choctaw auxiliary fields
2E	Single Runway; Choctaw auxiliary field
Anchor Alternative 3 – Choctaw Field	
3A	Parallel Runways and LHA; Duke auxiliary field
3B	Parallel Runways and LHA; Eglin 12 auxiliary field
3C	Parallel Runways and LHA; Eglin 12 and Duke auxiliary fields
3D	Single Runway and LHA; Eglin 12 and Duke auxiliary fields
3E	Single Runway and LHA; Duke auxiliary field

IAP = Initial Approach Pattern; LHA = Landing Helicopter Amphibious; SEIS = Supplemental Environmental Impact Statement

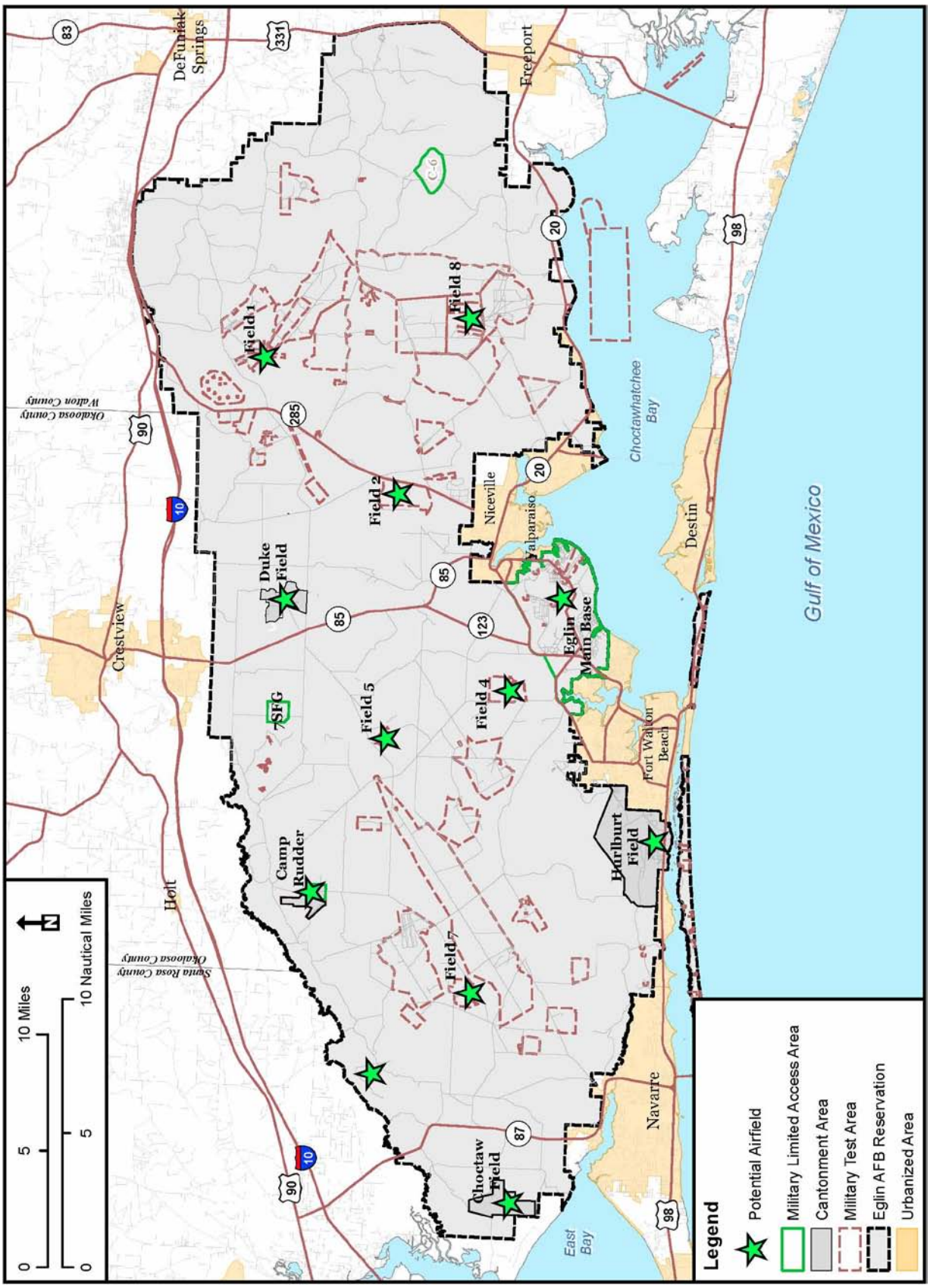

Figure ES–1. Potential Airfield Alternatives

Main Operating Base

Based on a three-phase alternative screening process detailed in Sections 2.3.1 and 2.3.2 of the SEIS, it was determined that two primary, or "anchor," alternatives could support the Main Operating Base (MOB) airfield requirements: Eglin Main Base and Duke Field. Choctaw Field was eliminated as a possible anchor location using the following screening criteria:

- Operational feasibility
- Capacity
- Range sustainment

More details regarding screening and selection of alternatives are presented in Section 2.3 of the SEIS.

Auxiliary Fields and Practice Instrument Approach Fields

After completing the MOB analysis, the Air Force studied potential locations for JSF auxiliary fields (detailed in Section 2.3.1 of the SEIS). The following locations met all of the screening criteria for auxiliary fields: Choctaw Field, Duke Field, and Eglin Main RW 12. These auxiliary fields would receive the majority of JSF operational flight training; however, Tyndall AFB and Naval Air Station (NAS) Pensacola would be used as well on an infrequent basis. More details are presented in Sections 2.3.1.2 and 2.3.1.2.1 of the SEIS.

Alternatives Considered

Alternatives 1A, 2A, 2B, 2C, 2D, and 2E, from Table ES–1, were carried forward for detailed analysis. Alternatives 1B, 1C, 1D, 1E, and 1H were eliminated because they would have violated land use guidelines for the clear zone, accident potential zone (APZ) I, and APZ II. Further consideration of Alternatives 1C, 1D, and 1E resulted in a new alternative, 1I, which was not presented during the public scoping meetings. Alternative 1I proposes a new single additional runway instead of two parallel runways as proposed in Alternatives 1C, 1D, and 1E. The runway would be oriented so that it would not place existing roads and facilities in the clear zone, APZ I, or APZ II. Alternative 1I was also carried forward for more detailed analysis in the SEIS. Alternatives 3A, 3B, 3C, 3D, and 3E were eliminated because they did not meet capacity and range sustainment requirements. (Note: Alternatives 1F and 1G have been carried forward as mitigations). Table ES–2 provides a summary of the alternatives carried forward for detailed analysis. Efforts were made to develop candidate alternatives that would reduce the use of Eglin Main RW 01/19. Therefore, alternatives that included a Main Operating Base at Duke Field or Choctaw Field used Eglin Main as an auxiliary field and specifically referenced the use of Eglin Main RW 12. However, after public scoping, it was recognized that JSF operations must still utilize RW 01/19 to accomplish

their mission because RW 01/19 is the primary runway for instrument flight rules (IFR) activities, while RW 12/30 is the primary runway for visual flight rules (VFR) activities. When Eglin Main is used as an auxiliary field, the Air Force will utilize RW 01/19, but the predominant number of JSF operations would occur on RW 12/30.

Table ES–2. Alternatives Carried Forward for Detailed Analysis

Alternative	Description
Alternative 1: Eglin Main Anchor Alternatives	
1A	No Runway Changes at Eglin Plus Use of Duke Field and Choctaw Field
1I*	One New Runway at Eglin Plus Use of Duke Field and Choctaw Field
Alternative 2: Duke Field Anchor Alternatives	
2A	Duke Field Parallel Runways and LHA Plus Choctaw Field
2B	Duke Field Parallel Runways and LHA Plus Eglin RW 12
2C	Duke Field Parallel Runways and LHA Plus Eglin RW 12 and Choctaw Field
2D	Duke Field Single Runway Plus Eglin RW 12 and Choctaw Field
2E	Duke Field Single Runway Plus Choctaw Field

*Alternatives 1B, 1C, 1D, 1E, 1F, 1G, and 1H were presented at the public scoping meeting, but were eliminated as alternatives carried forward for detailed analysis as described in Section 2.3.2 of the SEIS. One new alternative was developed after the scoping meetings and assigned the next sequential alphabetical identifier: 1I.

This section of the Executive Summary summarizes the Alternatives for the training missions, as well as the No Action Alternative.

3.1 NO ACTION ALTERNATIVE

The CEQ regulations (40 CFR 1502.14(d) and 32 CFR 989.8(d)) require the alternative analyses in an EIS to "include the alternative of no action." The No Action Alternative for the SEIS includes the 59 F-35 aircraft, the associated cantonment construction, and limited flight training operations that would be implemented at Eglin Main Base as described in the February 2009 ROD, which includes limitations for flight operations on RW 01/19. The No Action Alternative includes the beddown of three squadrons: an Air Force squadron with 24 F-35A aircraft, a Marine Corps squadron with 20 F-35B aircraft, and a Navy Fleet Replacement squadron with 15 F-35C aircraft. Delivery of the ROD-approved aircraft under the No Action Alternative, the F-35 aircraft required to train the instructors and students, began in July 2011.

The activities associated with the No Action Alternative are categorized as (1) Personnel, (2) Facilities/Infrastructure, (3) Air Operations, and (4) Ordnance Use. The following provides descriptions of activities under the No Action Alternative within these categories.

3.1.1 Personnel

Under the No Action Alternative, 59 F-35 aircraft would be authorized at Eglin AFB. Table ES–3 lists the maximum number of personnel associated with the JSF that would occur at the installation at any one time.

Table ES–3. Estimated End State Maximum Daily Load of JSF IJTS Personnel at Eglin AFB

Personnel	Number of Persons
United States Air Force	671
United States Navy	355
United States Marine Corps	343
United Kingdom	126
Total Military Permanent Personnel	**1,495**
Student Pilots (daily average)	64
Maintenance Students (daily average)	668
Total Military	**2,227**
Contractors	**254**
Total Daily JSF Personnel	**2,481**
*Dependents**	5,458
Total People New to Area	**7,939**

Source: AETC/A5RJ, 2009
AFB = Air Force Base; IJTS = Initial Joint Training Site; JSF = Joint Strike Fighter
*Due to lack of demographic data for the JSF IJTS program, dependent population estimates were based on Air Force Instruction (AFI) 65-503, A29-1 (fiscal year 2008) data. The overall average of Officer and Enlisted dependents was approximately 2.2 dependents per military member. It was assumed this distribution (2.2 dependents per military member/contractor) was consistent throughout the population.

3.1.2 Facilities/Infrastructure

Under the No Action Alternative, the Air Force would implement the BRAC-related and the Services' MILCON-funded programs required to house, feed, and accomplish academic and operational training for both pilot and maintenance students. The projects include, but are not limited to, construction of dormitories, dining facilities, squadron operations/aircraft maintenance unit (Sqd Ops/AMU) hangars, and the JSF Academic Training Facility.

The JSF IJTS would use the existing Munitions Storage Area (MSA) for the 96th Test Wing (96 TW), which is centrally located for access from either runway. The explosives storage would be within the confines of the existing MSA fence. The proposed operating facilities would be located outside the fence and along the western edge of the MSA. The removal of administration/supervisory buildings 1278, 1284, 1289, and Gazebo J would be required to achieve storage capability. The current parking area for privately owned vehicles (facility 1278C) would change from privately owned to government-owned vehicle parking. The supervisory facilities would be combined into a new building of approximately 7,000 square feet on Perimeter Road, where the gate to the 96 TW area is located.

The facilities associated with the No Action Alternative were previously analyzed in the FEIS, and all construction was authorized by the February 2009 ROD.

3.1.3 Air Operations

Under the No Action Alternative, the F-35 aircraft required to train the instructors and students began arriving in late calendar year (CY) 2011. The Air Force implemented an initial joint training capability and proceeded with basing 59 F-35 aircraft at Eglin AFB.

On average, approximately 65 sorties would be conducted per day, of which approximately 21 would be for Conventional Take-Off and Landing (CTOL) students, 28 for Short Take-Off Vertical Landing (STOVL) students, and 16 for Carrier Variant (CV) students. Due to certain military no-fly days, the aircraft (regardless of the Service) would fly only 232 days in a year, which may not necessarily occur on the same days. Approximately 15 percent of the total sorties are allocated to continuation training and cost-of-business. Continuation training is associated with maintaining instructor training currency, while cost-of-business addresses instructor proficiency, ferry flights, maintenance checks, etc., associated with the day-to-day training requirements. Pilot training will make up the remaining 85 percent of the sorties.

Table ES–4 illustrates the annual Air Traffic Control operations associated with the No Action Alternative for 59 F-35 aircraft (three squadrons). The SEIS's Appendix E, *Noise*, provides details on the number of flights that would occur on RW 01/19.

Table ES–4. Annual Air Traffic Control Operations Associated With the No Action Alternative

Aircraft Type	Eglin	Duke	Choctaw
F-35	43,071	18,650	20,263
Other*	99,289	22,403	75,831
Total	142,360	41,053	96,094

Source: AETC/A5RZ, 2012
Note: "Other" aircraft includes non-IJTS aircraft operating at Eglin AFB

3.1.4 Ordnance Use

The arrival of the F-35 at Eglin AFB will result in an increase in the amount of air-delivered ordnance utilized during training activities. The F-35 has an air-to-air and air-to-ground capability, and pilots will need to train for both.

The proposed F-35 flight training for the No Action Alternative includes air-to-surface delivery of ordnance including the guided bomb unit (GBU)-12 (live), GBU-12 (inert), and munitions countermeasures unit (MJU)-8/27 flares to targets on the Eglin Range. Some of the required JSF training includes the use of 25-millimeter (mm) ammunition during strafing runs. Most of these strafing events would be associated with Basic Air

to Ground (BAG) and Close Air Support (CAS) training events. Areas proposed for bombing practice with GBU-12 munitions are within Test Areas (TAs) C-52E and B-82. Training areas proposed for use in air-to-ground gunnery practice (25-mm cannon) are TAs C-62 and B-75. The use of other test areas would require approval by Eglin AFB on a case-by-case basis.

JSF students would also expend flares during a portion of their flights. The flares proposed for use include the MJU-8/27. Current flare use procedures in EAFBI 11-201, *Air Operations*, would be used during JSF flight training.

Flares may be used over the Eglin Range with a minimum altitude release of 200 feet above ground level (AGL) over TAs and 500 feet AGL over other areas. They may be employed within warning area W-151, provided the aircraft is above 1,500 feet AGL or the aircraft is below 1,500 feet AGL and at least 3 nautical miles (NM) from any surface vessel, platform, or land mass.

Table ES–5 lists the annual ordnance requirements for training under the No Action Alternative.

Table ES–5. Annual Ordnance Requirements for JSF Training for No Action Alternative

Type of Ordnance	Annual Quantity*
GBU-12 (live)	350
GBU-12 (inert)	121
25 mm (TP)	114,977
Flares (MJU-8/27)	752

Source: U.S. Air Force, 2008a
GBU = Guided Bomb Unit; JSF = Joint Strike Fighter; MJU = Munitions Countermeasures Unit; mm = millimeters; TP = Target Practice
*Annual quantities for 59 aircraft were extrapolated from the annual quantities list that was analyzed in the FEIS.

3.2 ALTERNATIVE 1: EGLIN MAIN BASE

For Alternative 1, there are certain common elements among its alternative options. The Main Operating Base would be Eglin Main Base, while any combination of Duke Field and Choctaw Field could be used for auxiliary fields. This section provides a description of Personnel, Facilities/Infrastructure, Air Operations, and Ordnance Use for Alternative 1 and its subalternatives 1A and 1I. The Air Force has identified Alternative 1A as the preferred alternative for the SEIS.

3.2.1 Personnel

The numbers of personnel for Alternative 1A and Alternative 1I are the same as for the No Action Alternative.

Table ES–3 lists the planned number of personnel associated with the JSF that would occur at the installation at any one time with 59 F-35 aircraft.

3.2.2 Facilities/Infrastructure

As previously approved in the February 2009 ROD, all support facilities for the IJTS (as outlined in the FEIS) such as dormitories, academic training, and flight simulators, would be located at Eglin Main Base.

The analysis for all proposed facilities associated with Alternative 1 was presented in the FEIS and is incorporated by reference where appropriate. Alternative 1A would eliminate RW 01/19 flight limitations identified in the February 2009 ROD; that is, the runway would be used for F-35 training activities instead of just landings/takeoffs and emergency use. Duke Field and Choctaw Field would support flight training activities and be used as auxiliary fields. Construction activities would be similar to those indicated in the FEIS.

Under Alternative 1I, one new runway would be constructed to the northwest of RW 12/30 on Eglin Main Base. The total acreage to be cleared for construction would be 2,127 acres. This option would include a taxiway across Florida Highway (Hwy) 85 to Eglin Main Base. Live munitions would need to be transported by wheeled vehicles to a new live ordnance loading area(s) located near the new runway area. A new precision instrument approach would be installed on the new runway. Choctaw Field and Duke Field would supplement activities on these new runways and be used as auxiliary fields. Construction activities would be the same as Alternative 1A with the exception of the following proposed facilities, all of which are associated with the construction of the new runway, which is an increase of approximately 5 million ft^2 over Alternative 1A:

- New runway and taxiway
- Additional control tower
- New fire and emergency services facility
- New end-of-runway shacks
- Aircraft barriers (BAK-14)

3.2.3 Air Operations

Figure ES–2 presents Eglin AFB and airspace used by Eglin aircraft in the southeastern United States. The JSF program will utilize all regional special use airspace (SUA). Figure ES–2 also shows the restricted airspace, military operating areas (MOAs), and military training routes (MTRs) that overlay Florida and Alabama. The F-35 aircraft is capable of supersonic flight and would conduct supersonic training in overwater warning areas in accordance with established Eglin procedures.

Table ES–6 illustrates the annual Air Traffic Control operations associated with Alternative 1. Alternative 1 would not retain the flight restrictions that the February 2009 ROD placed on RW 01/19. Nonetheless, all alternatives were designed, to the maximum extent practical, to minimize or avoid altogether the routine use of RW 01/19 for F-35 operations to avoid or reduce noise impacts. Appendix E, *Noise*, of the SEIS, details the number of flights that would occur on RW 01/19 for each alternative.

Table ES–6. Annual Air Traffic Control Operations Associated With Alternative 1

Aircraft Type	Eglin	Duke	Choctaw
F-35	43,071	18,650	20,263
Other*	99,289	22,403	75,831
Total	142,360	41,053	96,094

Source: AETC/A5RZ, 2012
* Note: "Other" aircraft includes non-IJTS aircraft operating at Eglin AFB.

JSF IJTS F-35 aircraft would utilize the runways at NAS Pensacola and Tyndall AFB for practice approaches under *all* of the action alternatives. JSF IJTS F-35 operations projected for NAS Pensacola are consistent with levels described in the FEIS. In contrast, the JSF IJTS F-35 operations projected for Tyndall AFB would represent an increase in operations over what was identified in the FEIS, as a result of the GRASI recommendations to relocate simulated flameout operations. The action alternatives would include 1,947 and 6,862 annual operations at NAS Pensacola and Tyndall AFB, respectively.

Seven recommendations from the GRASI were incorporated in the Alternative analyses to ensure that the proposed action of JSF IJTS could be implemented. One of those recommendations was the creation of four Air Traffic Control assigned airspaces (ATCAAs). The creation of the four ATCAAs will occur under a memorandum of understanding and will not require formal Federal Aviation Administration (FAA) rulemaking. Since the ATCAAs will be established at altitudes greater than 24,000 feet AGL, airspace is the only affected resource.

Another GRASI recommendation that is common across all action alternatives is the utilization of additional non-Eglin airspace to expand training opportunities. The additional SUA units evaluated include Camden Ridge/Pine Hill, Carabelle East/West, Compass Lake, Desoto/R-4401, W-155, and Moody AFB.

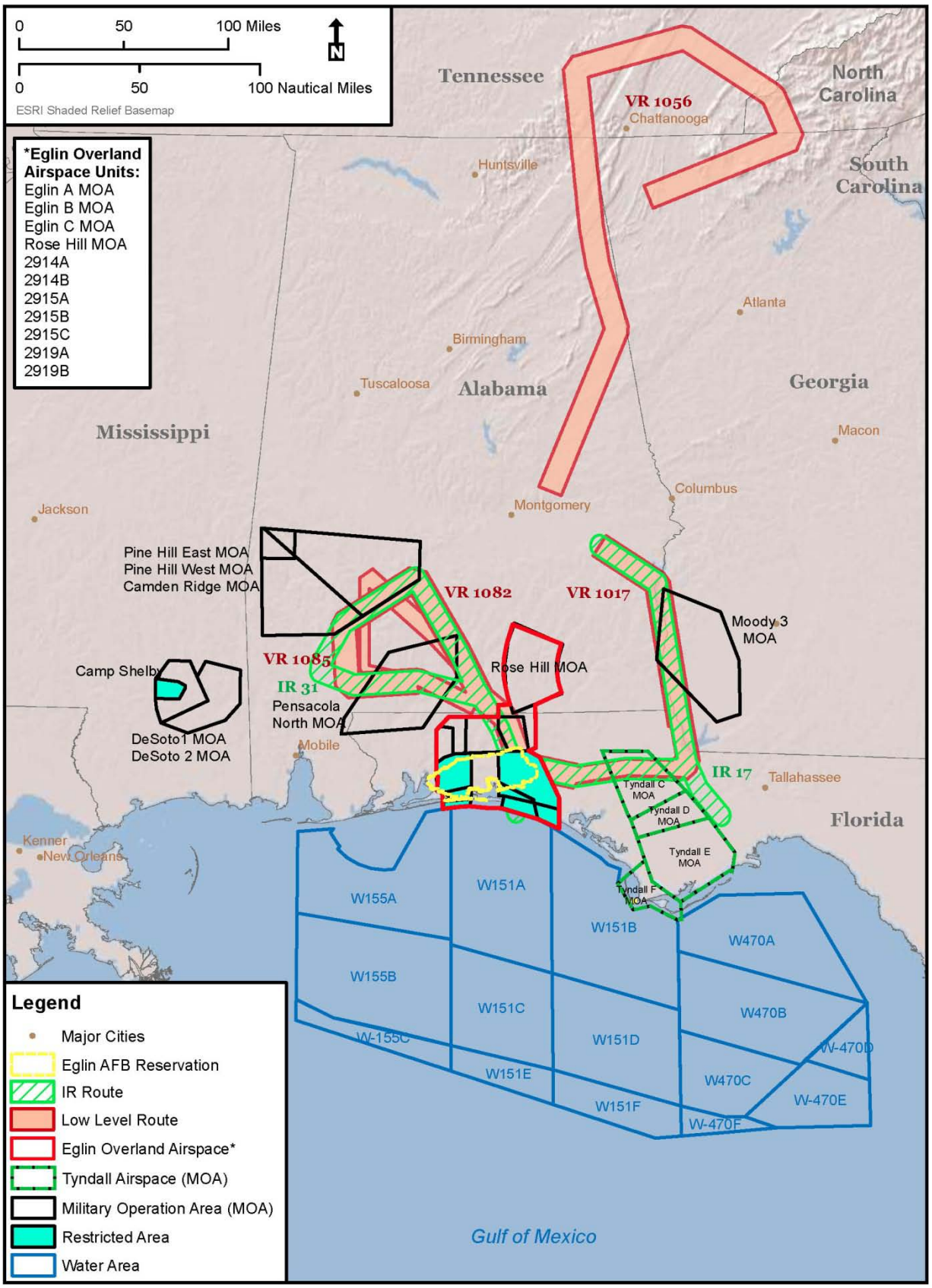

Figure ES–2. Location of Affected Military Airspace Units

3.2.4 Ordnance Use

The proposed F-35 flight training under the Proposed Action includes delivery of munitions including the Joint Direct Attack Munitions (JDAM) (inert), which include GBU-31, GBU-32 and GBU-38s, GBU-12 (live), GBU-12 (inert), and MJU-8/27 flares to targets on the Eglin Range. Some of the required JSF training includes the use of 25-mm ammunition during strafing runs. Most of these strafing events would be associated with BAG and CAS training events. Training areas proposed for use in air-to-ground gunnery practice (25-mm cannon) are ranges C-62 and B-75. Areas proposed for bombing practice with live GBU-12 munitions are within TA C-52, while inert GBU-12/31/32/38s will be supported on TAs C-52, B-70, and C-72. The use of other TAs would require approval by Eglin AFB or other Range Operating Authority (ROA) on a case-by-case basis. Table ES–7 lists the annual ordnance requirements for training under the Proposed Action.

Table ES–7. Annual Ordnance Requirements for JSF Training – Proposed Action

Type of Ordnance	Annual Quantity
GBU-12 (live)	36
GBU-12 (inert)	236
GBU-31 (inert)	62
GBU-32 (inert)	79
GBU-38 (inert)	95
25 mm (TP)	114,977
Flares (MJU-8/27)	752

Source: AETC/A5RJ, 2009
GBU = guided bomb unit; JSF = Joint Strike Fighter; MJU = munitions countermeasures unit; mm = millimeter; TP = target practice.

3.3 ALTERNATIVE 2: DUKE FIELD

Under Alternative 2, the Main Operating Base would be at Duke Field, while any combination of Eglin Main RW 12 and Choctaw Field would be used for auxiliary fields.

As with Alternative 1, JSF IJTS F-35 aircraft would utilize the runways at NAS Pensacola and Tyndall AFB for practice approaches under *all* of the action alternatives. The operational levels projected for NAS Pensacola and Tyndall AFB are the same as described for Alternative 1. In addition, the SUA and ATCAA under Alternative 2 will be utilized as described for Alternative 1.

3.3.1 Personnel

The numbers of personnel are the same as for Alternative 1.

3.3.2 Facilities/Infrastructure

A fuel line from Eglin Main Base would be constructed to provide the appropriate volume of JP-8 to support training activities. It is anticipated that this fuel line would be built within current utility easements or rights-of-way and would parallel Hwy 85 and Hwy 123.

New facilities proposed for construction at Duke Field under Alternative 2 are similar among Alternative 2 alternatives, except for the new runway–related facilities under Alternatives 2A, 2B, and 2C. Total construction under Alternative 2A, 2B, or 2C would be approximately 10,270,995 square feet (to include the new runway, taxiway, emergency services facility, etc.) and 4,983,805 square feet under Alternative 2D or 2E.

All support facilities for the IJTS such as dormitories, academic training, and flight simulators as outlined in the FEIS would be located at Eglin Main Base as previously approved in the February 2009 ROD and are not subject to analysis in this SEIS. Those facilities would not be constructed at Duke Field.

3.3.3 Air Operations

Table ES–8 illustrates the annual Air Traffic Control operations associated with Alternative 2A.

Table ES–8. Annual Air Traffic Control Operations Associated With Alternative 2A

Aircraft Type	Eglin	Duke	Choctaw
F-35	0	54,383	27,403
Other*	99,289	22,403	75,831
Total	**99,289**	**76,786**	**103,234**

Source: AETC/A5RZ, 2012; Sq = Squadrons
*Note: "Other" aircraft includes non-IJTS aircraft operating at Eglin AFB.

Alternative 2B would be located in the same notional area as Alternative 2A; however, flight operations would be supplemented by use of Eglin Main RW 12. Table ES–9 illustrates the annual Air Traffic Control operations associated with Alternative 2B.

Table ES–9. Annual Air Traffic Control Operations Associated With Alternative 2B

Aircraft Type	Eglin	Duke	Choctaw
F-35	14,962	66,725	0
Other*	99,289	22,403	75,831
Total	**114,251**	**89,128**	**75,831**

Source: AETC/A5RZ, 2012
*Note: "Other" aircraft includes non-IJTS aircraft operating at Eglin AFB.

Under Alternative 2C, the notional location and construction activities would be the same as Alternative 2A; however, flight operations would be supplemented by Eglin Main RW 12 and Choctaw Field. Table ES–10 illustrates the annual Air Traffic Control operations associated with Alternative 2C.

Table ES–10. Annual Air Traffic Control Operations Associated With Alternative 2C

Aircraft Type	Eglin	Duke	Choctaw
F-35	13,126	49,462	19,636
Other*	99,289	22,403	75,831
Total	**112,415**	**71,865**	**95,467**

Source: AETC/A5RZ, 2012
*Note: "Other" aircraft includes non-IJTS aircraft operating at Eglin AFB.

Under Alternative 2D, the current runway would be utilized, and precision instrument approach training would occur at Duke RW 18, while Choctaw Field and Eglin Main RW 12 would supplement flight operations. Table ES–11 illustrates the annual Air Traffic Control operations associated with Alternative 2D.

Table ES–11. Annual Air Traffic Control Operations Associated With Alternative 2D

Aircraft Type	Eglin	Duke	Choctaw
F-35	13,912	47,296	21,312
Other*	99,289	22,403	75,831
Total	**113,201**	**69,699**	**97,143**

Source: AETC/A5RZ, 2012
*Note: "Other" aircraft includes non-IJTS aircraft operating at Eglin AFB.

Under Alternative 2E, the current runway would be utilized, and precision instrument approach training would occur on Duke RW 18, while Choctaw Field would supplement flight operations. However, various fields in the surrounding area may be used as Practice Instrument Approach Fields (PIAFs) to relieve potential congestion but those operational activities will be at transient levels. Table ES–12 illustrates the annual Air Traffic Control operations associated with Alternative 2E.

Table ES–12. Annual Air Traffic Control Operations Associated With Alternative 2E

Aircraft Type	Eglin	Duke	Choctaw
F-35	0	53,905	26,793
Other*	99,289	22,403	75,831
Total	**99,289**	**76,308**	**102,624**

Source: AETC/A5RZ, 2012
*Note: "Other" aircraft includes non-IJTS aircraft operating at Eglin AFB.

3.3.4 Ordnance Use

The annual ordnance requirements for JSF training would be the same for Alternative 2 as for Alternative 1 (see Table ES–7 in Section 3.2.4).

4. ENVIRONMENTAL CONSEQUENCES

The environmental impacts for each resource area and alternative are presented below and are discussed for the No Action Alternative in the SEIS's Chapter 3 and in Chapter 4 for the Proposed Action alternatives.

As described in Section 4.1 of the SEIS, the JSF would sometimes utilize the runways at Tyndall AFB for practice approaches. Based on using a conservative operational level, noise modeling indicated that noise levels in the vicinity of Tyndall AFB would not noticeably exceed levels published in the *F-22 Operational Squadron and T-38A Detachment Beddown at Tyndall Air Force Base, Florida, Environmental Assessment* (*F-22 EA*) (U.S. Air Force, 2011c). Potential impacts at Tyndall AFB would be the same under all of the alternatives and are discussed in the appropriate resource section in Chapter 4 of the SEIS.

Proposed measures to reduce the potential for impacts are identified in Chapter 4 of the SEIS and discussed in Section 5 of this Executive Summary.

4.1 AIRSPACE

Air traffic controllers direct aircraft at the Eglin Air Force Base Air Traffic Control Tower.

Airspace management is defined as the direction, control, and handling of flight operations in the "navigable airspace" that overlies the geopolitical borders of the United States and its territories. "Navigable airspace" is airspace above the minimum altitudes of flight prescribed by regulations under USC Title 49, Subtitle VII, Part A, and includes airspace needed to ensure safety in the takeoff and landing of aircraft (49 USC 40102). Congress has charged the FAA with responsibility for developing plans and policy for the use of the navigable airspace and with responsibility for assigning by regulation or order the use of the airspace necessary to ensure the safety of aircraft and their efficient use (49 USC 40103(b); FAA Order 7400.2 2000).

JSF flight training operations associated with the action Alternatives would impact air traffic controller workload and would contribute to increased congestion (air and

ground delays) for military and civilian aircraft across the region. However, the Alternatives would include the implementation of GRASI recommendations as described in Sections 1.2.6, 2.3.4, and 2.3.5 of the SEIS, which would enhance Air Traffic Control flexibility and decision making to relieve some of the burden on air traffic controllers. GRASI recommendations also will help alleviate air and ground delays for military and civilian aircraft across the region. Conclusions in the GRASI strategic plan state that if the final set of recommendations are undertaken and approved by the FAA, it will "ensure a near optimum use of airspace by civilians and the military" (U.S. Air Force, 2011a).

4.2 NOISE

A public commenter wanted to see the noise models explained in more detail. Please see Appendix E, Noise, of the SEIS.

Noise is defined as unwanted sound. Potential noise impacts are dependent on characteristics of the noise such as sound level, pitch, and duration. Noise impacts are also strongly influenced by characteristics of the noise receiver (i.e., persons, animals, or objects that hear or are affected by noise). Annoyance, speech interference, sleep interference, human health effects (auditory and nonauditory), wildlife impacts, and structural damage are all issues subjected to analysis for potential noise impacts.

The SEIS's Section 4.3 addresses potential hearing loss, non-auditory health impacts in humans, annoyance, and damage to structures. Additional discussion of specific noise effects can be found in the SEIS's Section 4.4 (Land Use), Section 4.5 (Socioeconomics and Environmental Justice), Section 4.6 (Biological Resources), and Section 4.7 (Cultural Resources).

The SEIS estimates the noise levels and describes the impacted areas from JSF construction and flight training (Section 4.3 of the SEIS) for each of the seven Alternatives compared to the No Action Alternative. The SEIS's Appendix E, *Noise*, provides additional information on noise metrics and describes the methods used to model aircraft and munitions noise levels.

Construction Noise. Noise levels generated at typical construction sites were analyzed as part of the FEIS. While construction noise under all Alternatives may annoy people in the immediate vicinity of construction sites, construction noise would be temporary and would be expected to be limited to normal working hours (7:00 AM to 5:00 PM). Construction and demolition projects could generate minor vibration in nearby structures while impact tools such as jackhammers are in use. Noise impacts associated with construction noise and vibration would be limited to annoyance while projects are underway. Construction noise would be more widespread and of longer duration under Alternatives 1I, 2A, 2B, 2C, 2D, and 2E than under Alternative 1A due to additional large-scale construction projects.

Airspace Noise. Airspace noise impacts are the same for all of the alternatives and are discussed in detail in Section 3.3.5 of the SEIS. The region of influence (ROI) for noise in the airspace includes the areas beneath training airspace units proposed for use. Airspace proposed for use is currently used by a wide variety of military aircraft.

The noise levels reported in Table 3-7 of the SEIS are the highest noise levels projected beneath the route. In instances where aircraft noise is less than the ambient noise level, ambient noise would be dominant and the ambient level is listed in the table instead of the military aircraft noise level. It should be recognized that, even when the average military aircraft noise level is below ambient, aircraft noise may still be audible and some percentage of people may become highly annoyed.

Average subsonic noise levels beneath R-2915B would exceed 65 decibels (dB) L_{dnmr} by 1 dB, while noise levels beneath all other airspace units would remain below 65 dB L_{dnmr} (Table 3-7). (L_{dnmr} is the onset-rate adjusted monthly day-night average sound level, which is used to describe subsonic noise in military airspace.) The Air Force considers all land uses to be compatible at noise levels below 65 dB DNL (day-night average sound level), and considers noise-sensitive land uses such as residences to be conditionally compatible at 65 to 70 dB DNL if the structure provides above-average noise attenuation.

As shown in Table 3-7 of the SEIS, sonic boom noise levels would remain well below 55 dB CDNL (C-weighted decibels). Supersonic training is only permitted in airspace units located entirely over water. Although sonic booms may travel outwards from these training areas and be heard on land, this event is relatively infrequent.

The percentage of persons affected by subsonic and supersonic noise levels that would be expected to become highly annoyed was estimated using the standard Air Force methodology, as described in Finegold et al. (1994) and CHABA (1981), respectively. There are five SUA segments where projected noise levels could highly annoy 10 percent or more of the population. These segments are R-2915B, Eglin MOA C, VR-1082 B-C, VR-1082 C-D, and VR-1085 F1-F2. For more details and a list of noise levels and percent of the population highly annoyed under each airspace unit, refer to Table 3-7 of the SEIS. Noise impacts would be expected to be limited to annoyance and speech/activity interference.

Flight Operations. Noise contours for each alternative are depicted in Figure ES–3 through Figure ES–18. Table ES–13 shows a summary of the off-installation population that would be exposed to noise between 65–75 dB DNL and those that would be exposed to noise greater than 75 dB DNL for each alternative compared to the No Action Alternative and the 2006 AICUZ. In general, noise impacts under each alternative would vary substantially near Eglin Main, and noise impacts near Duke Field would be similar across all alternatives. The number of people exposed to noise greater than 65 dB DNL near Eglin Main would increase slightly compared to the No Action Alternative under all alternatives with the exception of Alternatives 2A and 2E

near Eglin Main, which would decrease. There would be two persons exposed to noise greater than 65 dB DNL near Choctaw Field under all of the proposed alternatives, with the exception of Alternative 2B, which would not expose any persons to noise greater than 65 dB DNL.

Table ES–13. Summary of Off-Installation Population Exposed to Noise

Alternative	Off-Installation Population					
	Eglin Main		Duke Field		Choctaw Field	
	65–75 dB DNL	>75 dB DNL	65–75 dB DNL	>75 dB DNL	65–75 dB DNL	>75 dB DNL
2006 AICUZ	2,243	164	0	0	0	0
No Action	1,623	174	1	0	2	0
1A	2,264	646	1	0	2	0
1I	1,632	226	1	0	2	0
2A	1,367	199	568	0	2	0
2B	1,680	235	567	0	0	0
2C	1,688	229	534	0	2	0
2D	1,685	242	774	0	2	0
2E	1,343	198	828	0	2	0

dB = decibels; DNL = day-night average sound level; AICUZ = Air Installation Compatible Use Zone Study
> = greater than; dB = decibels; DNL = day-night average sound level
Note: Acreage estimations do not include areas covered by water.
Population estimates were based on 2010 U.S. Census Bureau data. The number of persons currently residing in affected areas may differ from what has been stated.

Table ES–14 shows the number of residential parcels impacted by elevated noise levels in the vicinity of Eglin Main Base, Duke Field, and Choctaw Field. Where residential parcels were split by a noise contour line, the parcel was counted in the higher noise contour interval. For example, if a parcel was split by the 70-dB noise contour line, that parcel was counted in the 70–75 dB (not 65–70 dB) noise contour interval. Residential parcel information was derived from data Okaloosa and Santa Rosa Counties submitted to the Florida Department of Revenue for tax year 2009.

Table ES–14. Residential Parcels Affected by Noise Contours Under the No Action Alternative in the Vicinity of Airfields

Alternative	65–70 dB DNL	70-75 dB DNL	>75 dB DNL
No Action	413	226	53
1A	622	356	235
1I	409	252	67
2A	353	162	68
2B	463	247	76
2C	462	250	73
2D	464	243	78
2E	343	162	68

> = greater than; Choctaw = Choctaw Field; dB = decibels; DNL = day-night average sound level; Duke = Duke Field; Eglin = Eglin Main Base
Note: Residential parcel information was derived from data Okaloosa and Santa Rosa counties submitted to the Florida Department of Revenue for tax year 2009. The number of residential parcels located in affected areas may differ from what has been stated.

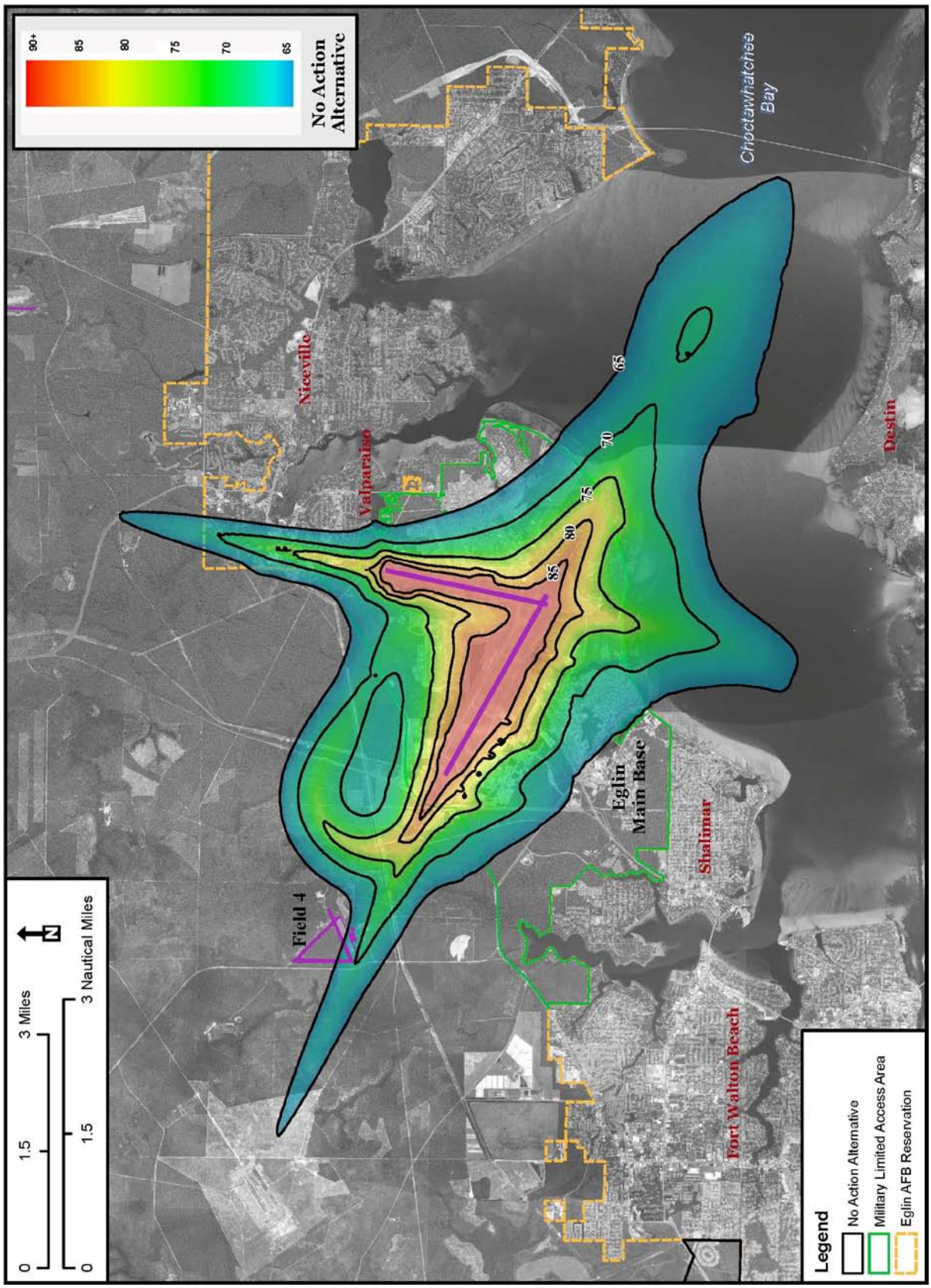

Figure ES–3. Noise Contours from F-35 and All Other Aircraft Under the No Action Alternative in the Vicinity of Eglin Main Base

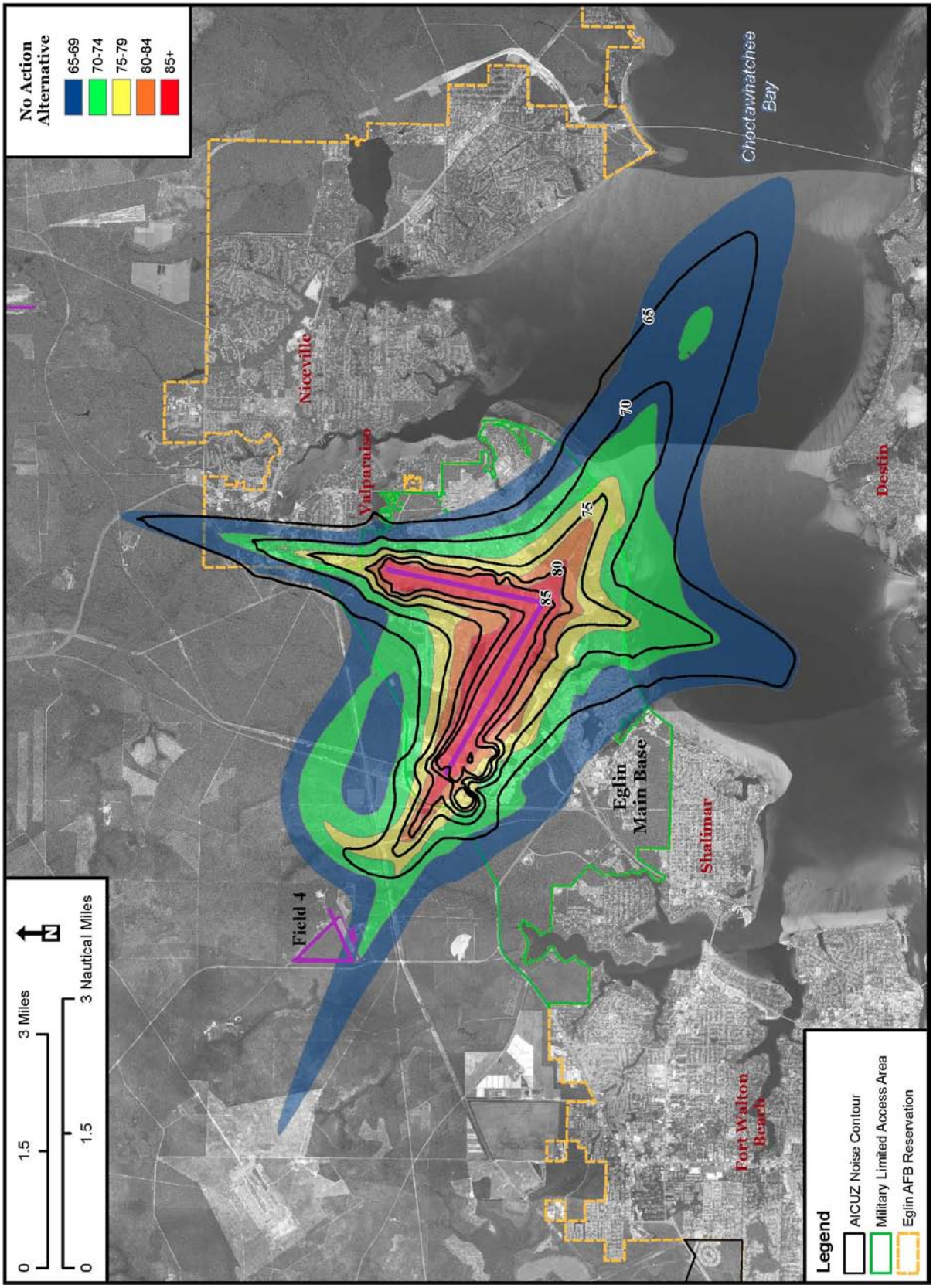

Figure ES–4. Noise Contours from 2006 AICUZ Study and F-35 and All Other Aircraft Under the No Action Alternative in the Vicinity of Eglin Main Base

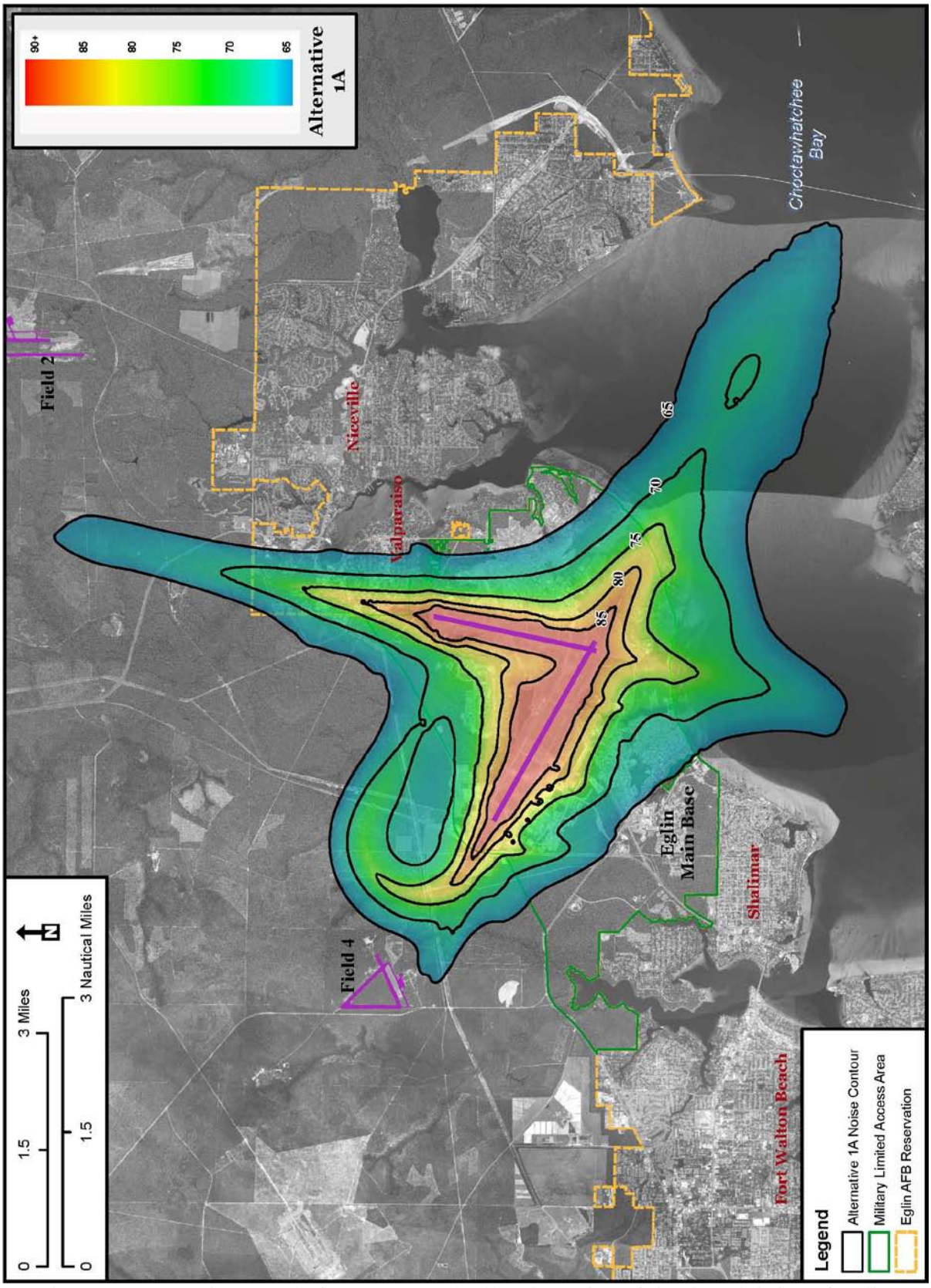

Figure ES–5. Noise Levels from F-35 and All Other Aircraft in the Vicinity of Eglin Main Under Alternative 1A (Preferred Alternative)

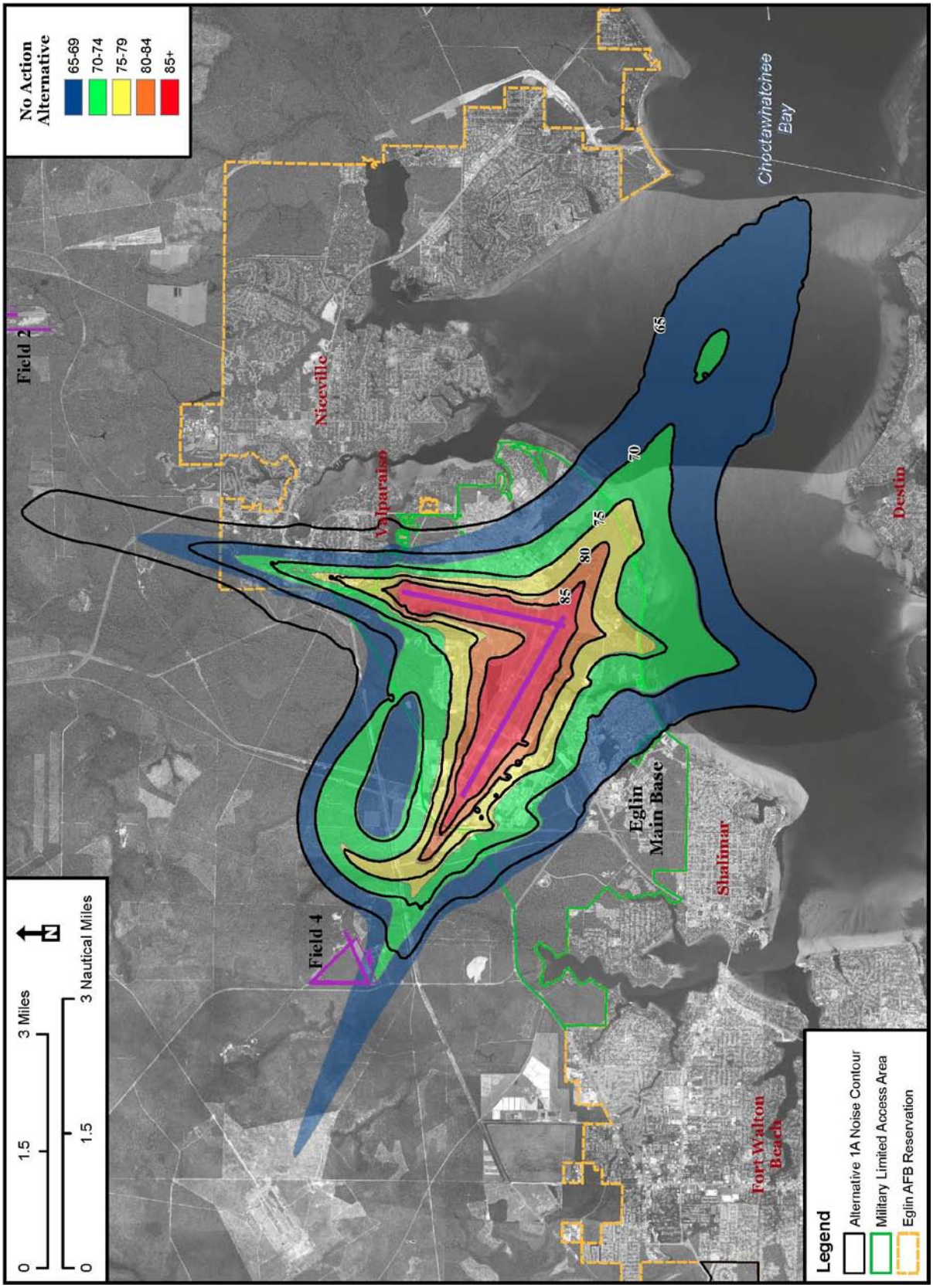

Figure ES–6. Noise Levels from F-35 and All Other Aircraft in the Vicinity of Eglin Main Under Alternative 1A (Preferred Alternative) and the No Action Alternative

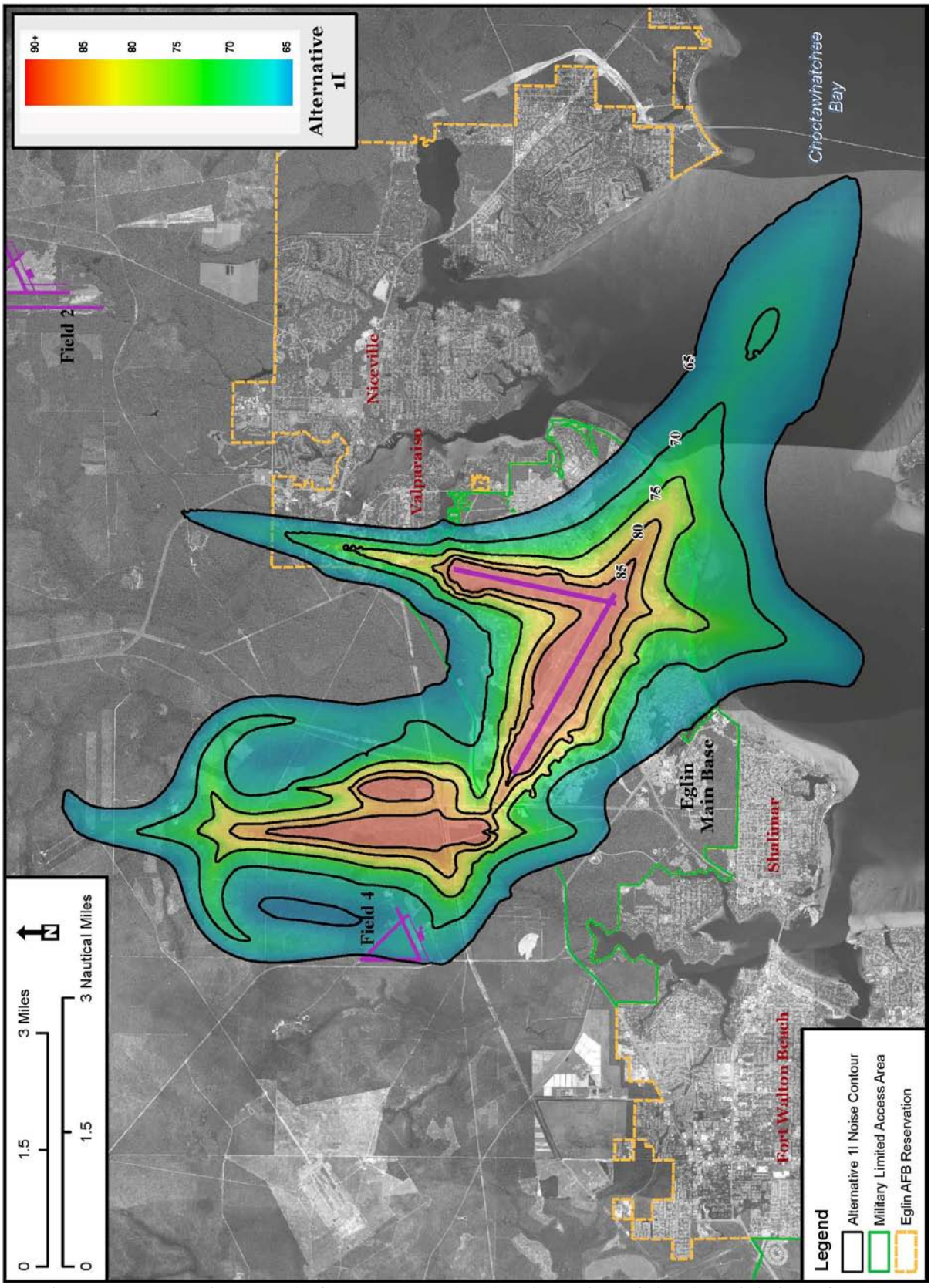

Figure ES–7. Noise Levels from F-35 and All Other Aircraft in the Vicinity of Eglin Main Under Alternative 1I

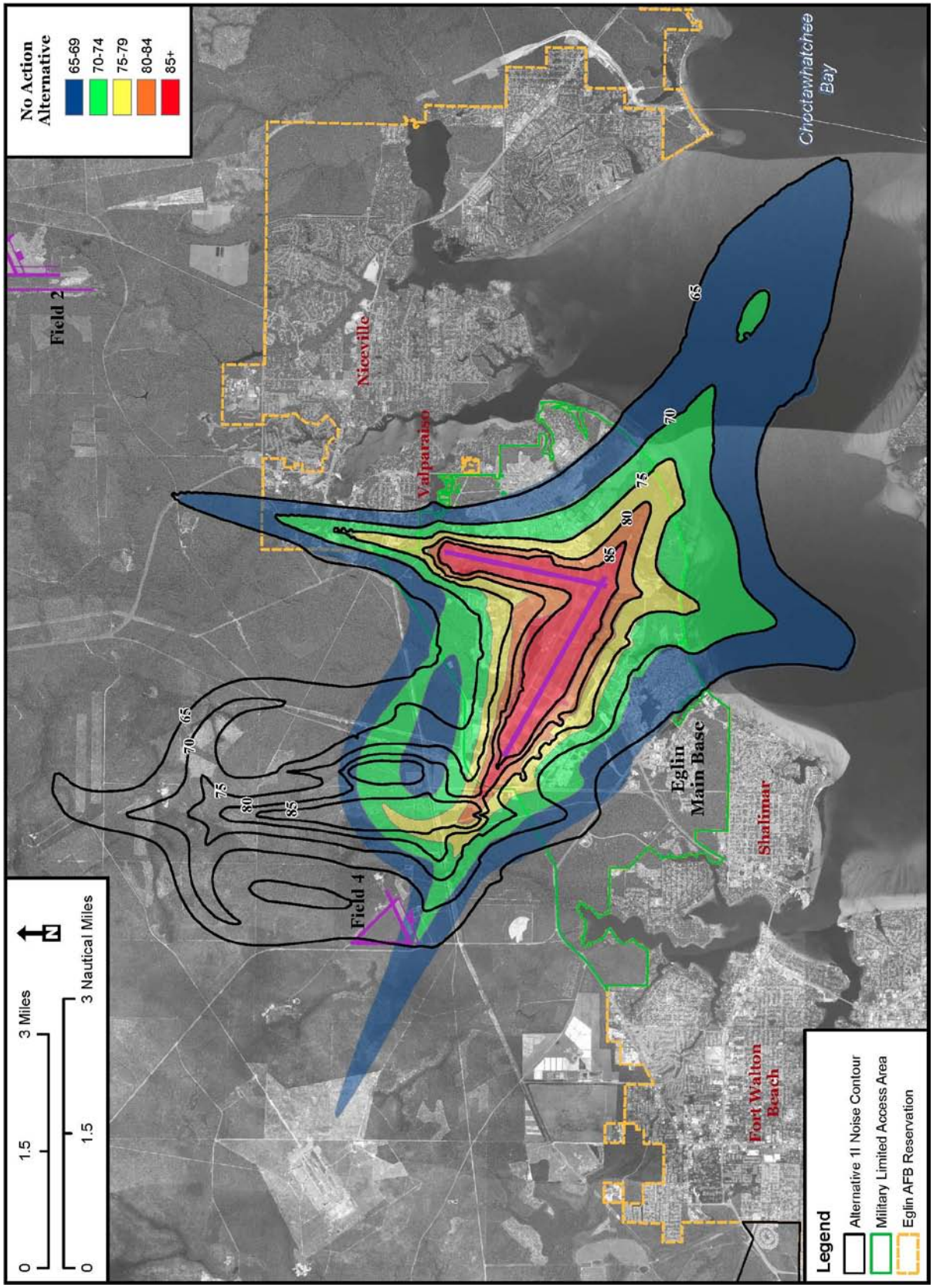

Figure ES–8. Noise Levels from F-35 and All Other Aircraft in the Vicinity of Eglin Main Under Alternative 1I and the No Action Alternative

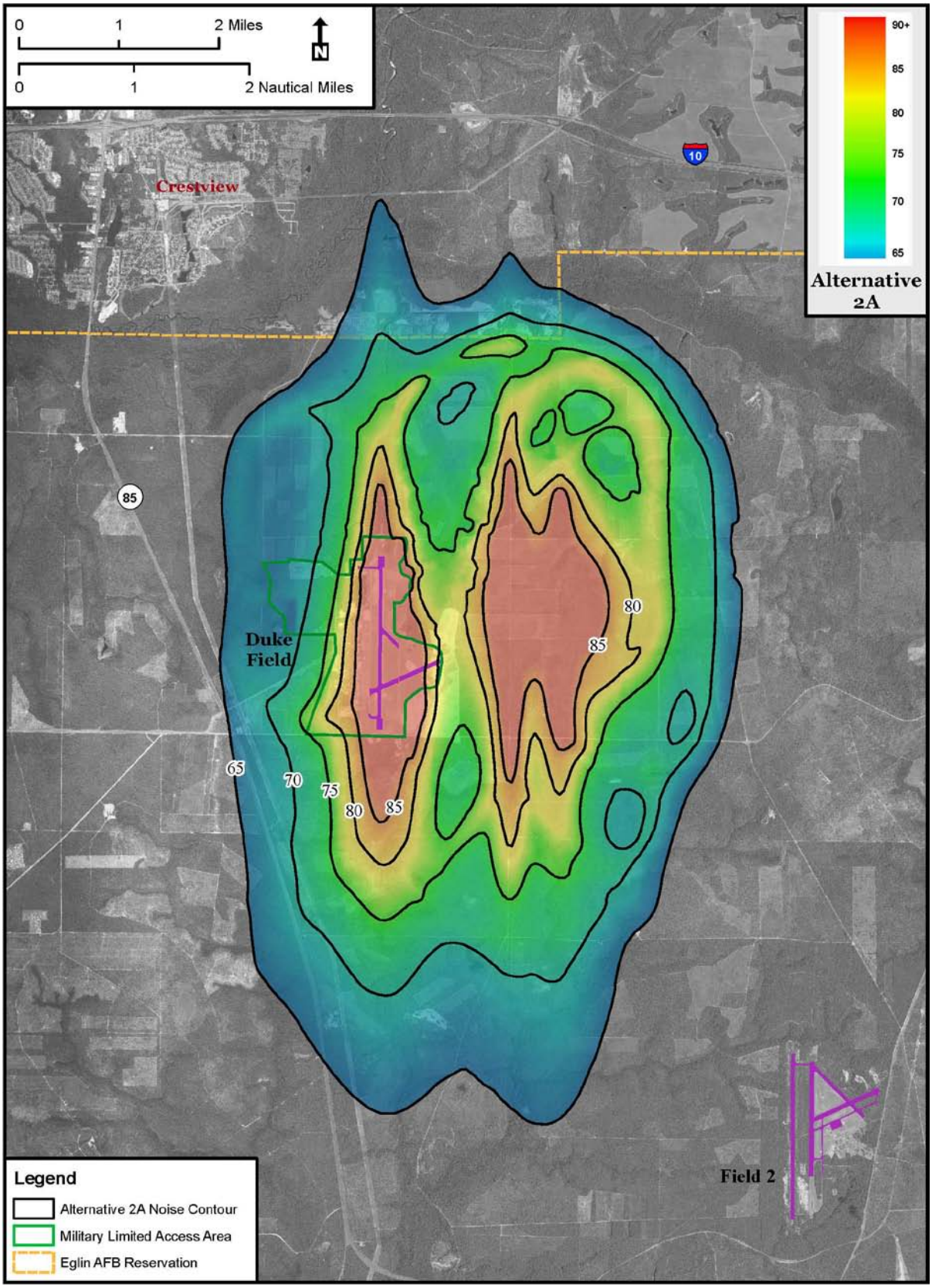

Figure ES–9. Noise Levels from F-35 and All Other Aircraft in the Vicinity of Duke Field Under Alternative 2A

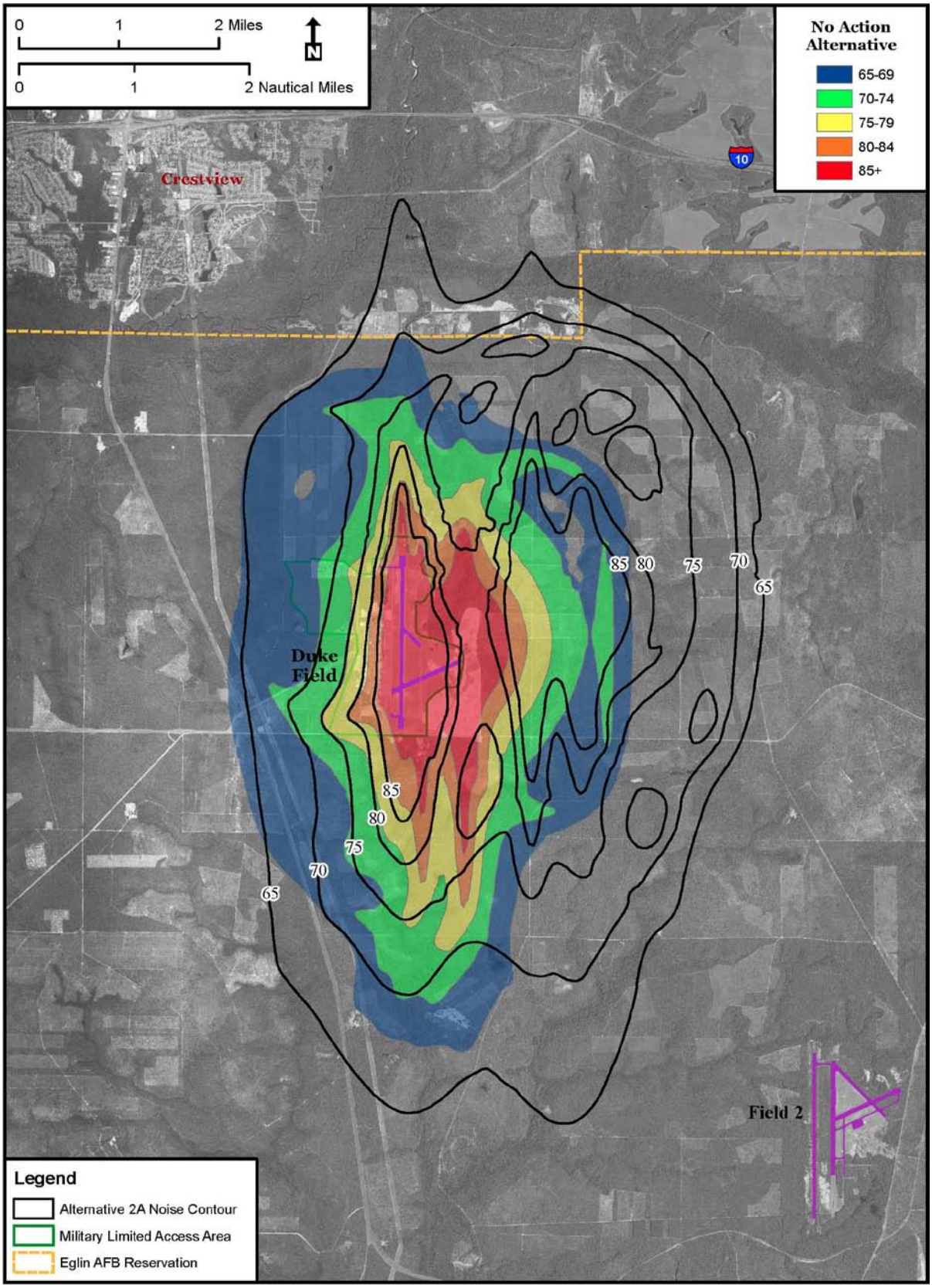

Figure ES–10. Noise Levels from F-35 and All Other Aircraft in the Vicinity of Duke Field Under Alternative 2A and the No Action Alternative

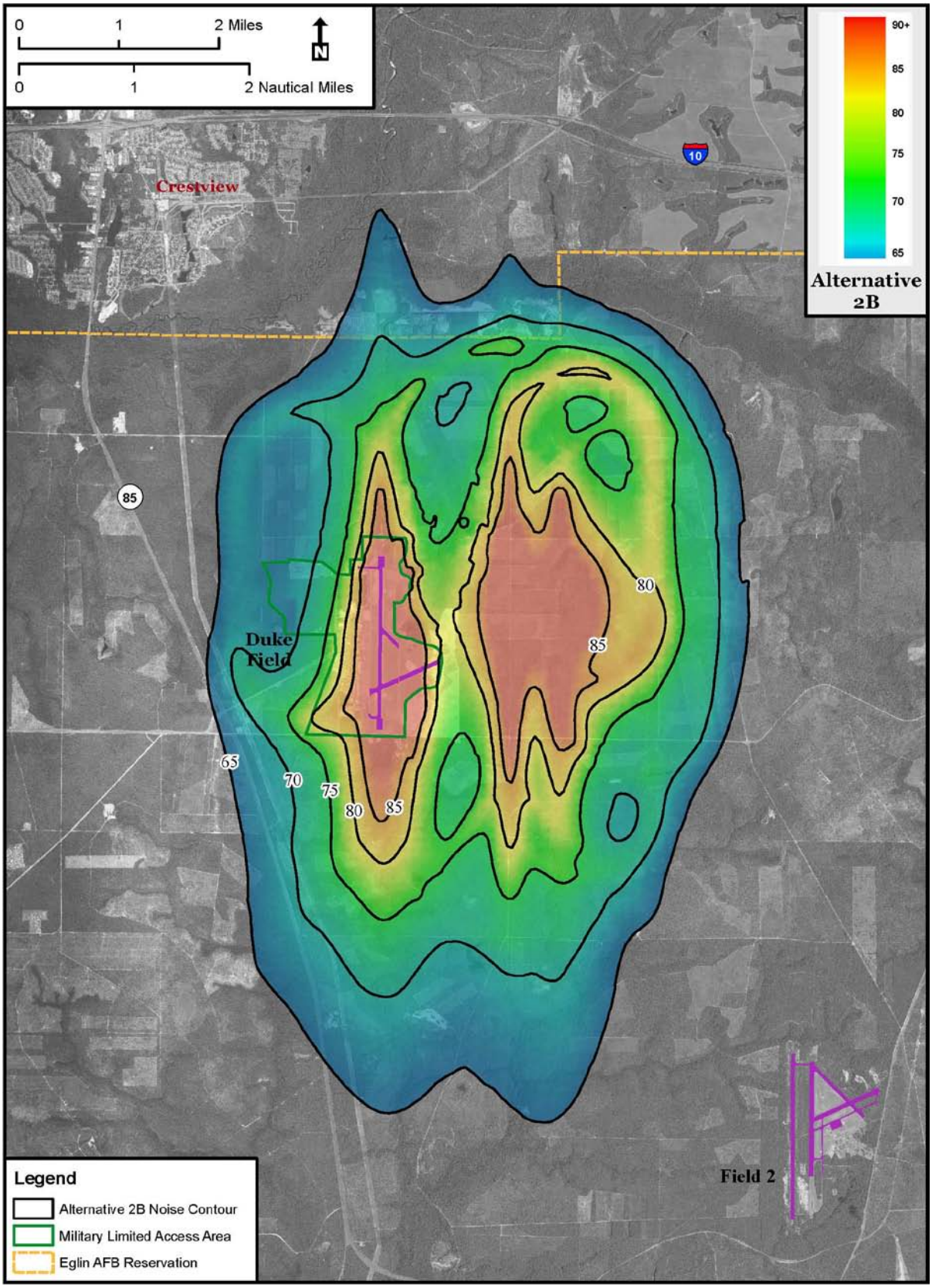

Figure ES–11. Noise Levels from F-35 and All Other Aircraft in the Vicinity of Duke Field Under Alternative 2B

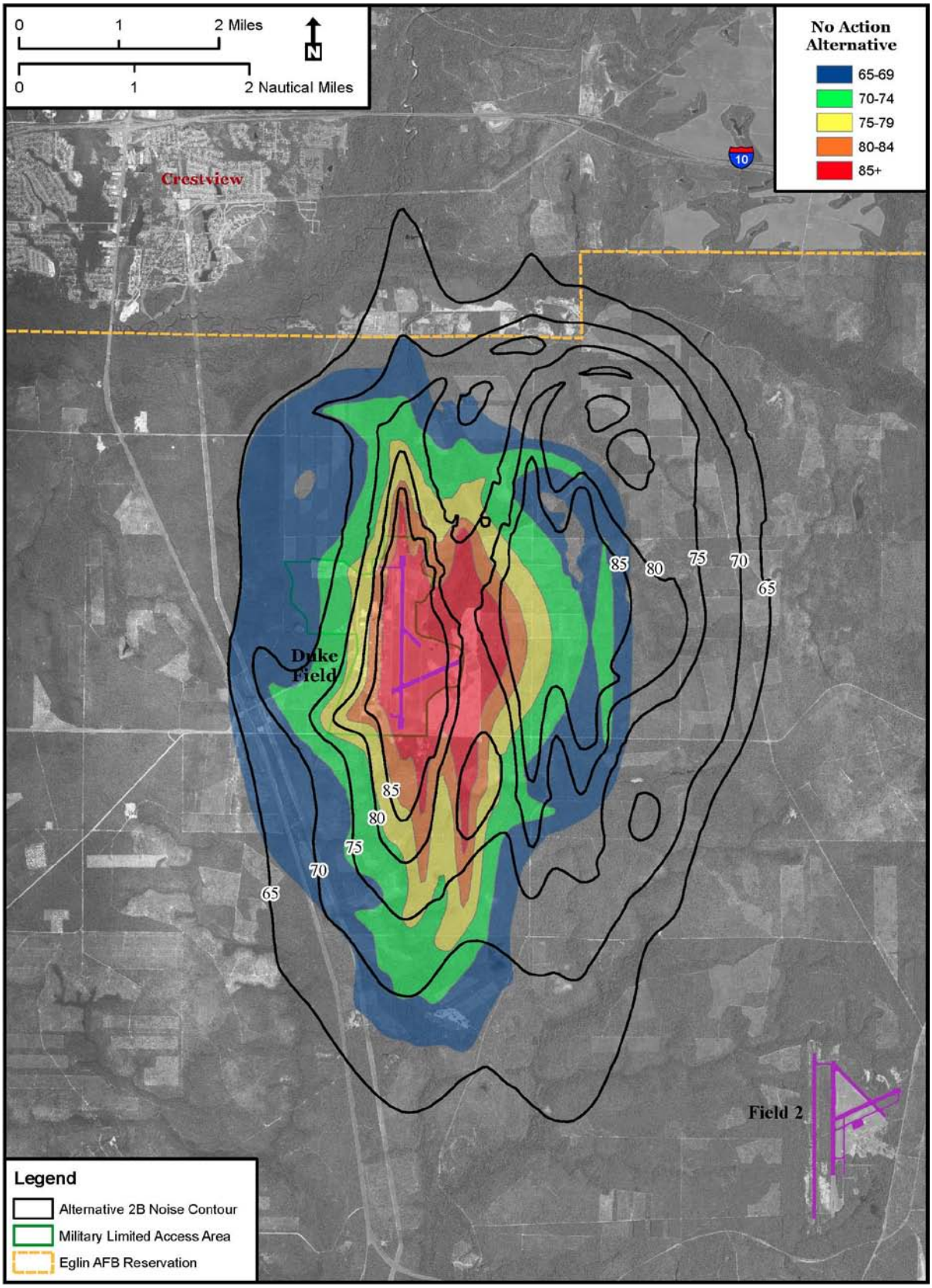

Figure ES–12. Noise Levels from F-35 and All Other Aircraft in the Vicinity of Duke Field Under Alternative 2B and the No Action Alternative

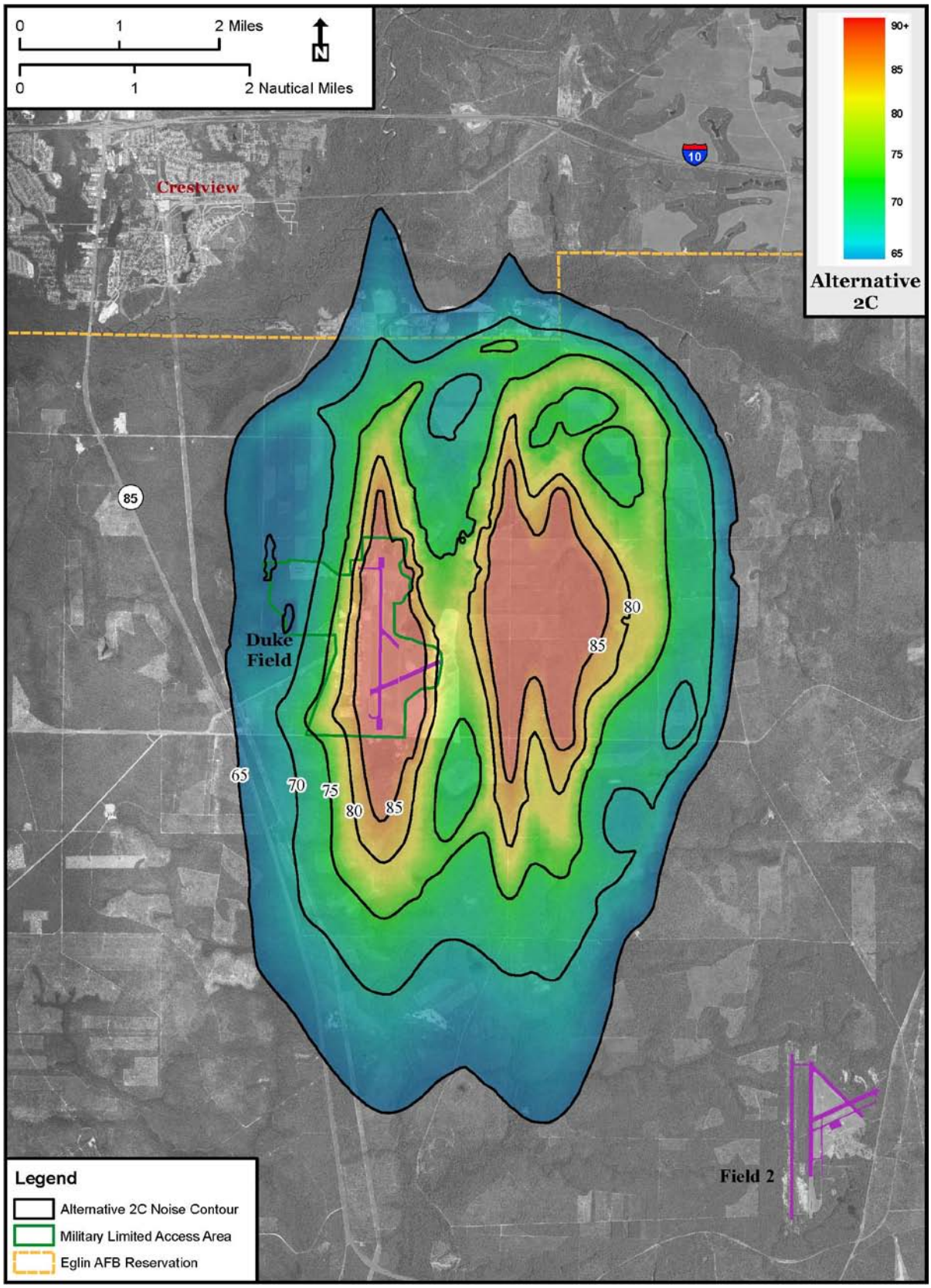

Figure ES–13. Noise Levels from F-35 and All Other Aircraft in the Vicinity of Duke Field Under Alternative 2C

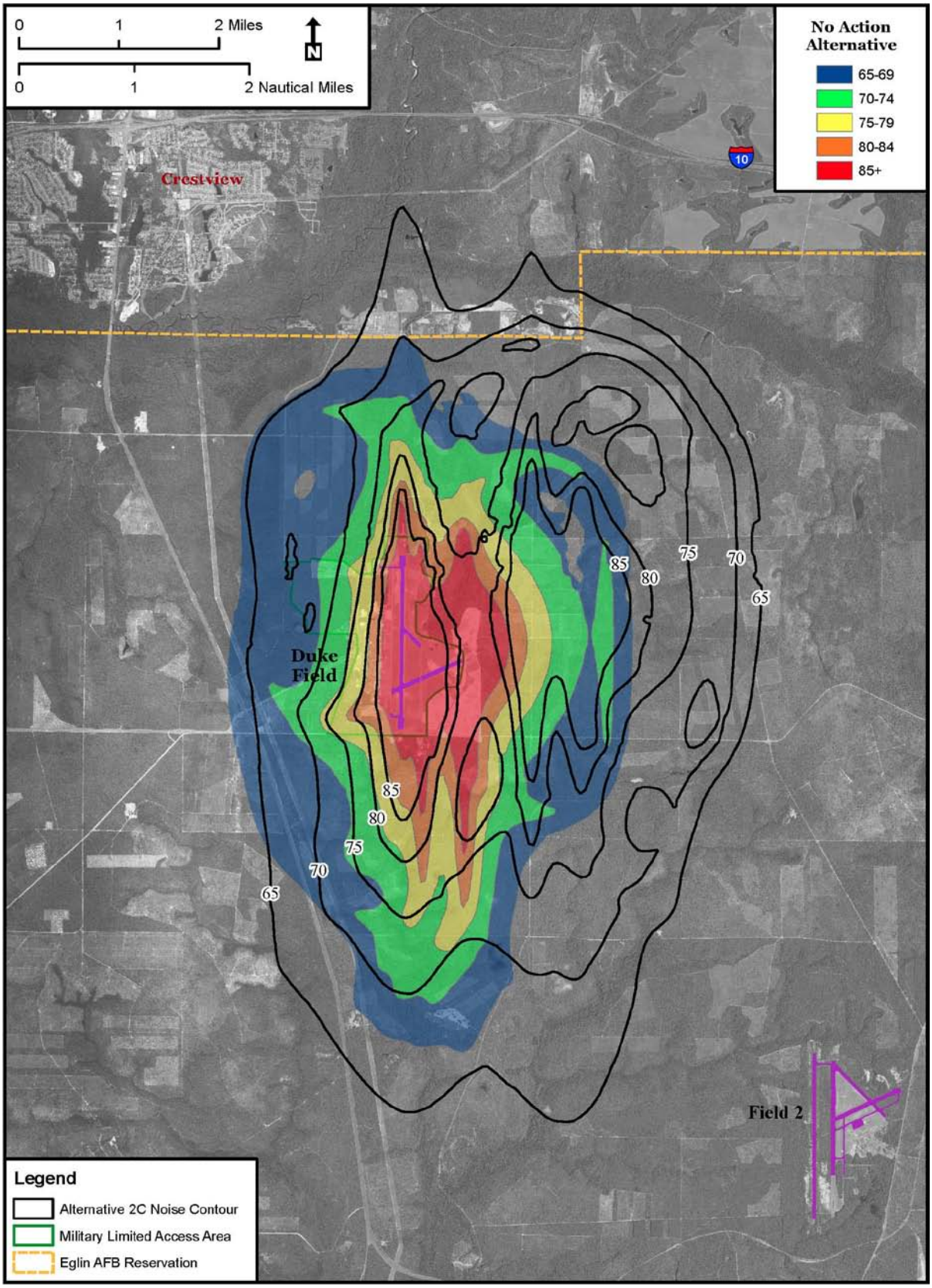

Figure ES–14. Noise Levels from F-35 and All Other Aircraft in the Vicinity of Duke Field Under Alternative 2C and the No Action Alternative

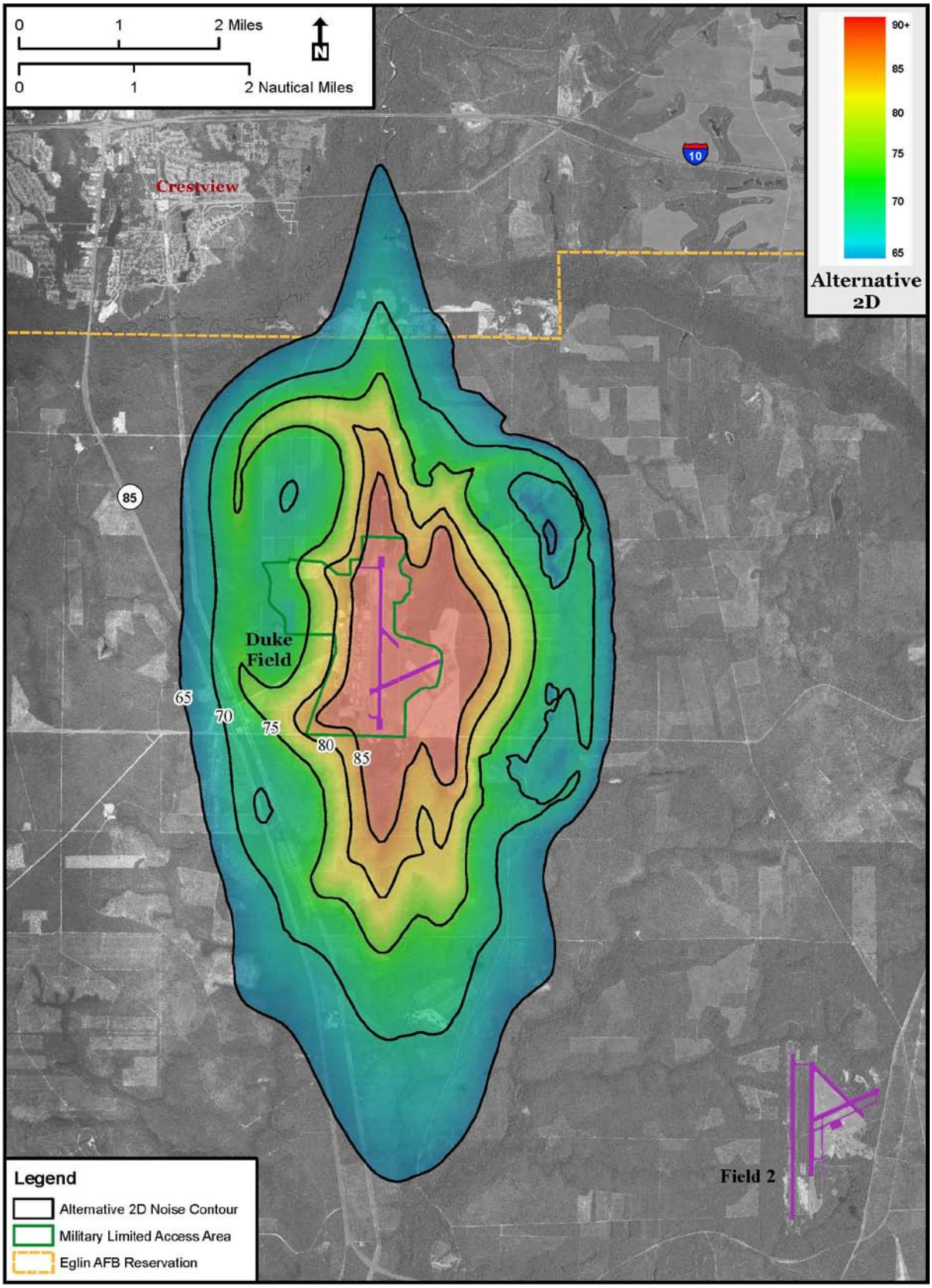

Figure ES–15. Noise Levels from F-35 and All Other Aircraft in the Vicinity of Duke Field Under Alternative 2D

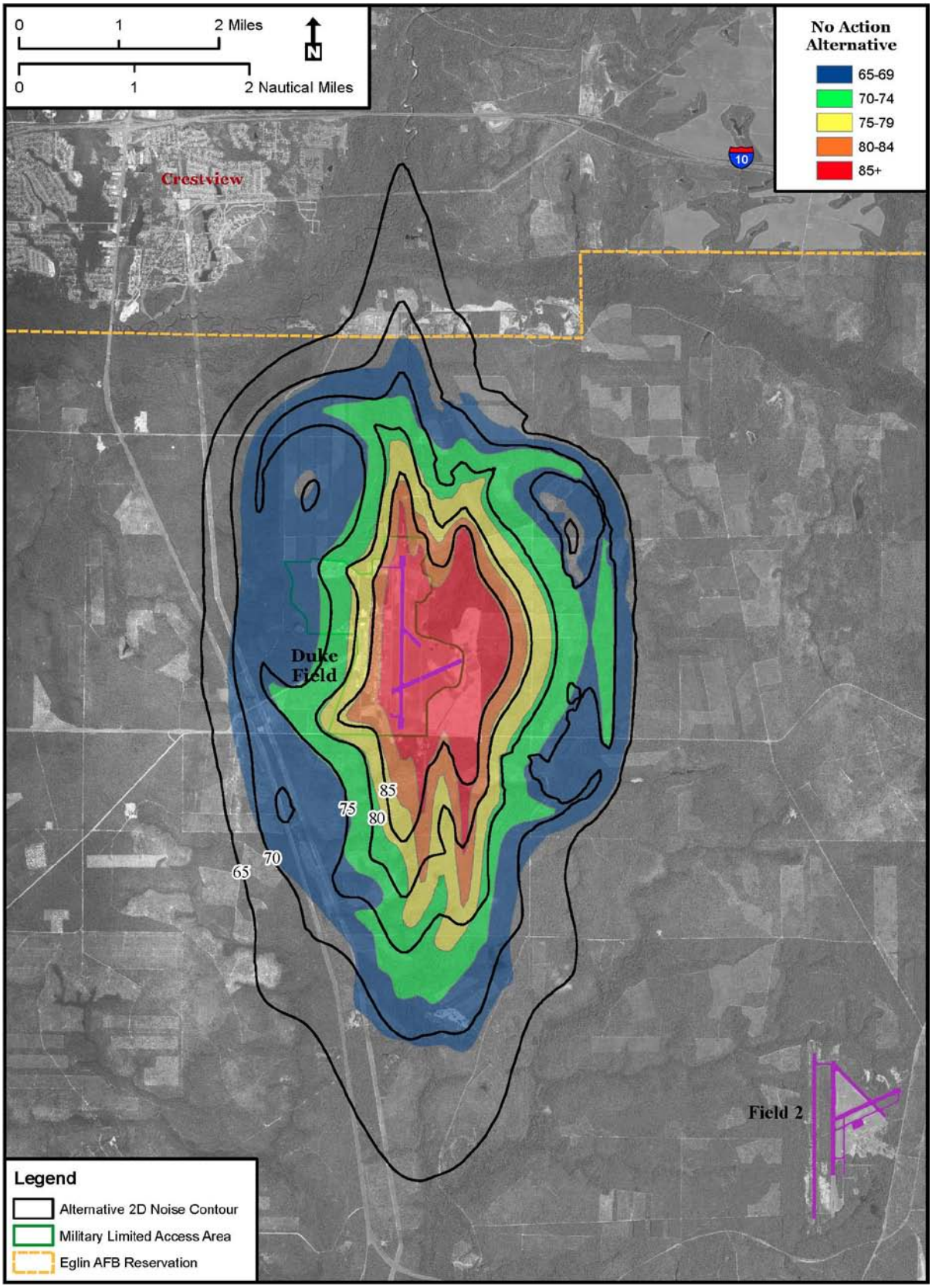

Figure ES–16. Noise Levels from F-35 and All Other Aircraft in the Vicinity of Duke Field Under Alternative 2D and the No Action Alternative

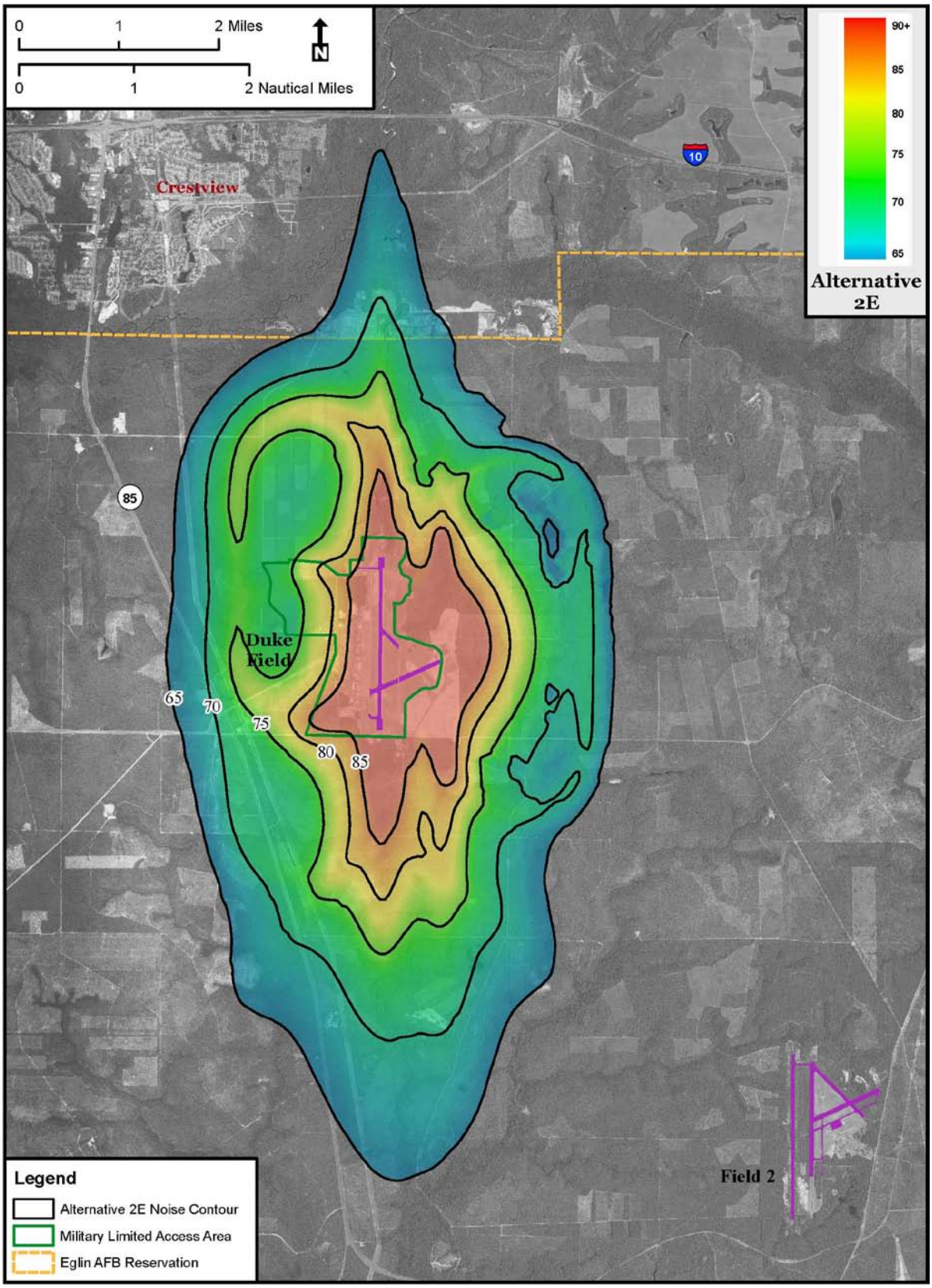

Figure ES–17. Noise Levels from F-35 and All Other Aircraft in the Vicinity of Duke Field Under Alternative 2E

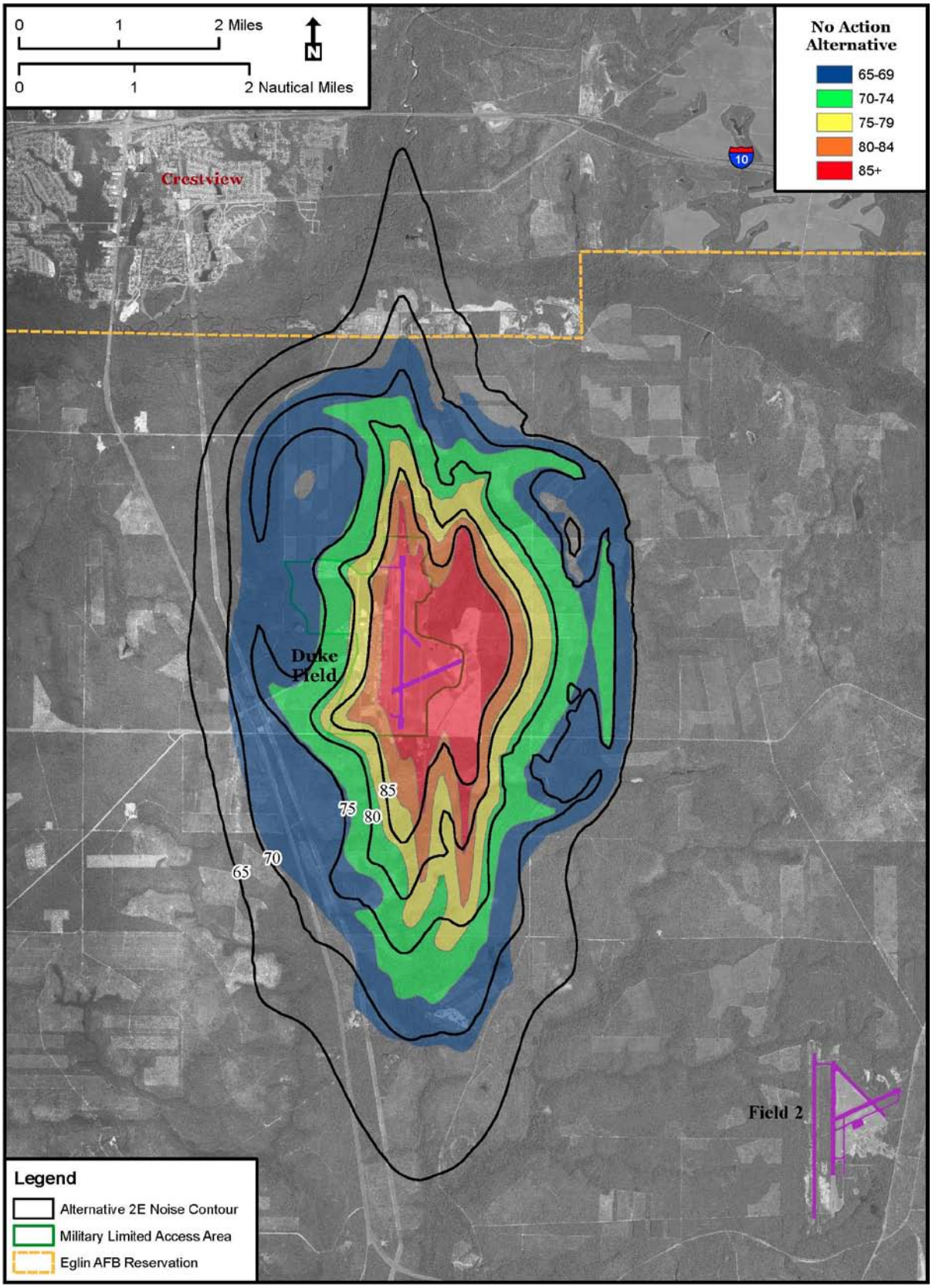

Figure ES–18. Noise Levels from F-35 and All Other Aircraft in the Vicinity of Duke Field Under Alternative 2E and the No Action Alternative

The number of persons exposed to noise levels ranging between 80 and 90 dB DNL, the range with the highest risk of potential hearing loss, were also estimated. Please see Sections 3.3.3 and 4.3 in the SEIS for more information. Under Alternative 1A, an estimated 97 persons would be exposed to noise greater than 80 dB DNL. Under Alternative 2B, 2C, and 2D, 19, 17, and 13 persons, respectively, were estimated to be exposed to noise greater than 80 dB DNL. There are no persons at risk for potential hearing loss under the No Action Alternative and Alternatives 1I, 2A and 2E.

Munitions Noise. The number of each type of munitions used annually would be the same under all alternative scenarios. The munitions include several types of bombs, missiles, and explosives charges. Peak noise levels resulting from individual detonation events do not normally exceed 130 dB at off-range locations currently. As the munitions used by the JSF program would not be new to the Eglin Range and existing targets would continue to be used, peak noise levels would not increase from those experienced currently.

4.3 LAND USE

Land use generally refers to the management and use of land by people. The attributes of land use include general land use patterns, land ownership, land management plans, and special use areas. General land use patterns characterize the types of uses within a particular area. Specific uses of land typically include residential, commercial, industrial, agricultural, military, public/institutional, and recreational. Land use also includes areas set aside for preservation or protection of natural resources, wildlife habitat, vegetation, or unique features. Management plans, policies, ordinances, and regulations determine the types of uses that are allowable or the types of uses that protect specially designated or environmentally sensitive uses.

Eglin has many outdoor recreational opportunities. Popular activities include deer, turkey and feral hog hunting; fishing Eglin's 21 ponds; primitive camping; canoeing scenic waters; mountain biking in the Timberlake Recreation Area; and hiking the Florida National Scenic Trail.

For purposes of the SEIS analysis, land use impacts are those associated with increases in noise (due to an increase in air operations and the introduction of a new aircraft, the F-35) as well as land uses impacted by new development (such as runways, ramps, and facilities). A more detailed discussion can be found in Sections 3.4 and 4.4 of the SEIS.

Construction. Construction-related land use impacts associated with the No Action Alternative were previously analyzed in the FEIS, and construction was authorized by the February 2009 ROD. Under Alternative 1A, no land use impacts would occur, while under Alternative 1I, new runway construction at Eglin Main Base would eliminate

public access and outdoor recreation, including hunting in the affected area (206 acres in Management Unit [MU] 5 and 1,587 acres in MU 6A). Under Alternatives 2A, 2B, and 2C, construction of a new runway and Landing Helicopter Amphibious (LHA) deck at Duke Field would remove 164 acres in MU 7, 265 acres in MU 7A, 1,092 acres in MU 9, and 1,556 acres in MU 9A from public access and outdoor recreation. An existing game check station would also need to be relocated. Construction of additional JSF facilities at Duke Field would remove an additional 226 acres within MU 9A under all Alternative 2 subalternatives.

Flight Operations. Under the No Action Alternative, sensitive noise receptors at Eglin Main Base exposed to noise greater than 75 dB DNL include the Oakhill School, horse stables, and the Georgia Avenue accompanied housing area. The entire developed area of Duke Field would be exposed to noise levels greater than 65 dB DNL, and there would be no impact on land use compatibility at Choctaw Field. The total off-installation area affected by noise (greater than 65 dB DNL) from air operations for each alternative compared to the No Action Alternative and the 2006 AICUZ is shown in Table ES–15. Off-base noise exposure at Choctaw Field is similar across all alternatives and would not adversely impact existing off-base land use compatibility. Areas affected by noise on and off Eglin Main Base under Alternative 1A would be greater than under the No Action Alternative. Under Alternative 1I, noise exposures from air operations at Eglin Main Base would affect smaller areas of Valparaiso and Niceville because of the heavier use of the new runway.

Table ES–15. Total Number of Off-Installation Acres Impacted by Noise Greater than 65 dB DNL Compared to the No Action Alternative

Alternative	Off-Installation Land Use (in Acres)		
	Eglin Main	Duke Field	Choctaw Field
2006 AICUZ	**843**	**0**	**0**
No Action	**685**	**0.08**	**2,134**
1A	1,070	0.08	2,127
1I	699	0.08	2,128
2A	603	912	2,348
2B	718	887	89
2C	719	827	2,233
2D	723	708	2,107
2E	593	787	2,432

AICUZ = Air Installation Compatible Use Zone Study

Under Alternative 2A, Eglin Main Base would not be utilized for JSF air operations. Use of the new runway at Duke Field would shift the off-base noise exposure to the east of Shoal River. Under Alternative 2B, the affected off-base area north of Duke Field would be smaller than under Alternative 2A because of the use of Eglin Main Base. Choctaw Field would not be utilized. Under Alternative 2C, the total off-base area affected by noise is smaller than under Alternative 2B because of the additional use of Choctaw Field. Alternative 2D has similar exposures to noise as Alternative 2B at Eglin

Main Base, and the affected off-base area north of Duke Field would be slightly smaller than for Alternatives 2A, 2B, and 2C. The affected off-base area north of Duke Field under Alternative 2E would be slightly greater than Alternative 2D. Eglin Main Base would not be utilized for JSF air operations under this alternative.

4.4 SOCIOECONOMICS AND ENVIRONMENTAL JUSTICE

Socioeconomic resources are defined as the basic attributes associated with human activities such as population characteristics, economic activity (including employment and income), and public services (schools, law enforcement, and emergency services). Actions that impact these socioeconomic indicators may have effects on other socioeconomic indicators such as housing availability.

Executive Order (EO) 12898, *Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations*, directs federal agencies to identify and address, as appropriate, disproportionately high and adverse human health or environmental effects of their programs, policies, and activities on minority populations and low-income populations. In addition to environmental justice issues are concerns pursuant to EO 13045, *Protection of Children from Environmental Health Risks and Safety Risks*, which directs federal agencies to the extent permitted by law and appropriate and consistent with the agency's mission to (a) make it a high priority to identify and assess environmental health risks and safety risks that may disproportionately affect children; and (b) ensure that its policies, programs, activities, and standards address disproportionate risks to children that result from environmental health risks or safety risks.

Socioeconomic effects are primarily driven by changes in population, which in turn drive changes in other socioeconomic indicators such as employment and housing. As discussed in Section 4.5 in the SEIS, the ROI for the socioeconomic and environmental justice resources for all BRAC-related actions is defined as Okaloosa, Santa Rosa, and Walton Counties.

Construction. The beddown of 59 F-35 aircraft would bring 2,481 military and contractor personnel to Eglin AFB and the surrounding ROI. The Air Force assumed that 2.2 dependents would accompany the military and contractor personnel for a total of 5,458 dependents. The total increase in population directly related to the JSF IJTS would be 7,939 persons, an increase of 2.05 percent. Employment created by the beddown would add 2,481 jobs directly and thereby induce an additional 1,039 jobs for a total employment increase of 1.82 percent over existing conditions. The induced employment would most likely be filled by local workers or spouses of the incoming personnel. However, if the induced employment is filled by workers migrating to the area, an additional 1,039 persons could be expected, bringing the total population increase to 2.32 percent over existing conditions.

Assuming one job represents one household, a total of 3,520 housing units would be demanded as a result of the beddown. Okaloosa County alone currently has approximately 22,000 vacant housing units, including seasonal rentals. Therefore, it is anticipated that the local housing market is sufficient to meet the demands of the incoming population. Accompanying the incoming personnel from the F-35 beddown would be an estimated 1,294 school-aged children, increasing the student population 2.03 percent over existing conditions. All of the school districts in the ROI have average class sizes below the state-mandated maximum class sizes. There is also a program in which parents have the option to apply for a waiver for students to attend schools outside of their resident attendance zone. Therefore, it is anticipated that the school districts have the capacity to accommodate the increase in student population while remaining compliant with maximum class size mandates. Additionally, the increase in population increases the tax base on which the school districts are dependent for funding. The increase in population would result in an estimated increase in revenues of $13.08 million. For public services, the change in population is not expected to substantially change the demand for law enforcement, fire fighting services, or health care professionals. No disproportionate adverse impacts or risks to children are anticipated as a result of personnel changes or construction activities associated with the beddown of 59 F-35 aircraft.

Student increases are estimated for the region although the actual increase to a specific school district would depend on individual choices.

During scoping, one commenter expressed concern that the new demands on the Eglin Range Complex would exceed its capacity and that the 46th Test Wing would leave Eglin AFB causing the loss of high paying jobs. Please see SEIS Section 4.5.1.1.

Flight Operations. Under the No Action Alternative, average noise levels above 65 dB DNL would impact approximately 1,797 residents in the vicinity of Eglin Main Base, one resident in the vicinity of Duke Field, and two residents in the vicinity of Choctaw Field. The highest average noise levels off-base would be between 75 and 80 dB DNL, which would affect 174 residents in the vicinity of Eglin Main Base. No residents in the vicinity of Duke Field or Choctaw Field would be exposed to noise levels above 70 dB DNL under the No Action Alternative. Under these conditions, it is not expected that the change in noise levels from the F-35 would adversely impact property values or quality of life for residents. However, the residents affected by the noise levels may be annoyed by overflights. Tourism would not be adversely affected as the highest noise levels are directed away from the beaches and waterways that have the potential for high concentrations of tourists. Therefore, noise levels under the No Action Alternative are not expected to have significant adverse socioeconomic impacts.

In general, the beddown of 59 F-35 aircraft across all action alternatives could have an adverse effect on socioeconomic factors such as property value, tourism, and outdoor recreation. While property values are more likely to be directly affected by other factors such as property or neighborhood characteristics and the local real estate market, there is the potential that the noise generated by the F-35 could have an adverse impact to property values. The U.S. Environmental Protection Agency (USEPA) has identified a DNL of 55 dB to be a level protective of the public health and welfare. This represents a threshold below which adverse noise effects are generally not expected. The FAA and DoD have identified residential use as incompatible with noise levels above 65 dB DNL unless special measures are taken to reduce interior noise levels for affected residences. Residential use is identified as incompatible regardless of noise attenuation at noise levels greater than 75 dB DNL (see Appendix E of the SEIS).

Northwest Florida Regional Airport

A scoping commenter expressed concern that the F-35 training operations sharing both runways with the Northwest Florida Regional Airport would affect the airport's operations. See Section 4.5.1.1 in the SEIS.

Noise levels generated by 59 F-35 aircraft with unconstrained flight operations would not directly impact areas where high concentrations of tourism is expected, specifically on the beaches and coastline properties. Persons involved in outdoor recreation do have the potential to be annoyed by noise generated from overflights; however, it is not expected that these noise levels would discourage tourism as a whole in the ROI. In summary, the beddown of 59 F-35 aircraft without constraints on flight operations could have an adverse impact on the socioeconomic conditions in the ROI, specifically on property values.

The off-installation population affected by noise levels greater than 65 dB DNL is discussed for each alternative in Section 4.2, *Noise,* of this Executive Summary. Also, see Figure ES–3 through Figure ES–18 in Section 4.2 of this Executive Summary.

For environmental justice, noise has been identified as an adverse impact that could potentially have disproportionate effects. The only county directly affected by noise levels generated at Eglin Main Base is Okaloosa County. Noise levels generated at Duke Field and Choctaw Field can affect Okaloosa and Santa Rosa Counties. Therefore, those two counties provide the community of comparison for the minority, low-income, and youth affected populations. Minorities comprise 21.54 percent of the total affected population as compared to 22.9 percent of the total population in Okaloosa County. Low-income populations comprise 8.18 percent of the total affected population as compared to nearly 10.6 percent of the total low-income population in Okaloosa County. Children under the age of 18 comprise an estimated 29.0 percent of the total

population affected by noise levels greater than 65 dB DNL compared with 22.3 percent of the population in Okaloosa County.

Under the No Action Alternative and Alternatives 1 and 2, no adverse impacts are anticipated to disproportionately impact minority, low-income, or youth populations. While the proportion of the affected minority and low-income population under each alternative is slightly higher than the total share in Okaloosa County, the higher level of affected low-income and minority populations is primarily the result of Duke Field aircraft overflight of incarcerated persons at the Okaloosa Correctional Institute and the Okaloosa Youth Academy, an alternative school for at-risk youth. The existing structure and construction of these incarceration facilities is expected to provide the necessary 30 dB noise attenuation needed to be compatible according to FAA and DoD land use compatibilities. The share of minority and low-income persons and children affected by adverse noise levels above 65 dB DNL are comparable to the community of comparison.

For noise levels above 75 dB DNL, educational services are not compatible regardless of noise attenuation. Therefore, the noise levels under the following alternatives could have adverse impacts to children, which may be considered significant.

Under the No Action Alternative, two schools would be affected by noise levels between 65 and 75 dB DNL and one daycare center would be affected by noise levels between 75 and 79 dB DNL. Under Alternative 1A, three schools would be exposed to average noise levels between 70 and 75 dB DNL. One daycare center could be exposed to noise levels between 75 and 80 dB DNL and another daycare center could be exposed to noise levels between 65 and 70 dB DNL. Under Alternative 1I, three schools could be exposed to noise levels between 65 and 70 dB DNL. No schools would be affected by noise levels greater than 70 dB DNL. Under Alternative 2A, one school could be exposed to noise levels between 65 and 69 dB DNL and one daycare center could be exposed to noise levels between 75 and 80 dB DNL. Under Alternatives 2B, 2C, and 2D, three schools could be exposed to noise levels between 65 and 69 dB DNL and one daycare center could be exposed to noise levels between 75 and 79 dB DNL. Additionally under Alternative 2D, one school could be exposed to noise levels between 65 and 74 dB DNL. Under Alternative 2E, one school and one daycare center in the vicinity of Eglin Main Base could be exposed to noise levels between 65 and 69 dB DNL and one daycare center could be exposed to noise levels between 75 and 79 dB DNL.

4.5 TRANSPORTATION

Transportation is defined as the movement of goods from place to place. In general, transportation refers to air, water, and ground vehicles and the services that make use of these infrastructures. Roadways are an example of a transportation infrastructure for automobiles, trucks, and buses to carry both people and goods.

Transportation resources analyzed within the SEIS include the regional roadway network adjacent to the airfields proposed for the beddown of the F-35 aircraft, as outlined in Chapter 2 of the SEIS, and the local roadway network within Eglin Main Base gates. Collectively, these resources compose the ROI for transportation.

Section 4.6 in the SEIS describes in detail the results of the transportation impacts of the F-35 beddown. Appendix B, *Transportation,* provides a general description of the transportation demand modeling process, trip generation, and inputs utilized for transportation impact analysis.

Construction. Impacts of construction-related traffic (construction vehicles and trips generated by construction workers) are temporary in nature and cannot be accurately modeled using the transportation model. This assessment of potential impacts is qualitative in nature.

Under the No Action Alternative, eight roadway segments within the study area are currently deficient with respect to the adopted level of service (LOS). All eight of them operate at LOS F in the peak-hour, peak-direction including portions of Hwy 85, U.S. Highway 98 (US 98), and Hwy 189. Any impacts from construction-related activities would negatively impact these facilities. Hwy 85 currently fails in the peak hour from Interstate 10 (I-10) south through Crestview, as well as in the vicinity of the Air Combat Command (ACC) Gate and from Hwy 20 to Hwy 397 east of the Commercial Gate/North Gate. Construction vehicles should coordinate routes with the county and the Florida Department of Transportation (FDOT) to avoid peak-hour impacts on these facilities.

In general, constructed-related activities under Alternative 1 would be substantially the same as under the No Action Alternative. Alternative 1I, with the construction of a new runway northwest of RW 12/32, additionally may require the relocation of Hwy 85, General Bond Boulevard, or Hwy 123, or portions thereof, and significant impacts to the regional transportation network would be anticipated but would be temporary.

Under Alternative 2, construction-related impacts for each alternative would be substantially the same as the No Action Alternative. Additional transportation impacts would be anticipated in the Hwy 85 corridor that provides access to the Duke Field area. Currently scheduled improvements will not completely address the existing deficiency; thus, mitigation measures could be necessary if the Proposed Action is shown to have a significant impact on the operations of Hwy 85.

Overall, most of the deficient roadways identified in the SEIS Proposed Action analysis as needing improvement are also deficient under the No Action Alternative, indicating that the deficiency will exist even if no Proposed Action alternative is implemented.

Flight Operations. There would be no transportation impacts associated with implementing any of the flight training alternatives.

4.6 UTILITIES

The utilities include potable water, wastewater, electricity, and natural gas. Water that is drinkable by humans is referred to as *potable water*, and *wastewater* is water that has been used and contains dissolved or suspended waste materials. Additional descriptions of each utility are available in the FEIS, Section 3.6, Utilities.

The analysis (Section 4.7 in the SEIS) focuses on the current utilities on Eglin Main Base and Duke Field that would be used to support the Proposed Action and analyzes their suitability and efficiency.

Construction. Under the No Action Alternative and Alternatives 1 and 2, potable water and wastewater would remain within permitted limits; therefore, no adverse impacts are expected. Under any of the proposed alternatives, additional infrastructure may be required; however, increased electricity and natural gas consumption would not cause an adverse impact to the electrical or natural gas supply in northwest Florida.

Flight Operations. There are no impacts to utilities associated with implementing any of the flight training alternatives.

4.7 AIR QUALITY

Criteria Pollutants

Air quality is determined by the type and concentration of pollutants in the atmosphere, the size and topography of the air basin, and local and regional meteorological influences. The significance of a pollutant concentration in a region or geographical area is determined by comparing it to federal and/or state ambient air quality standards. Under the authority of the Clean Air Act, the USEPA has established nationwide air quality standards to protect public health and welfare with an adequate margin of safety. Criteria pollutants include carbon monoxide (CO), nitrogen oxides (NO_x), particulate matter with an aerodynamic diameter less than 10 microns (PM_{10}), sulfur oxides (SO_x), and volatile organic compounds (VOCs).

Potential impacts to air quality are evaluated in the SEIS (Section 4.8) with respect to the extent, context, and intensity of the impact in relation to relevant regulations, guidelines, and scientific documentation. The CEQ defines significance in terms of context and intensity in 40 CFR 1508.27. This requires that the significance of the action must be analyzed in respect to the setting of the proposed action and based relative to the severity of the impact. The CEQ NEPA regulations (40 CFR 1508.27(b)) provide 10 key factors to consider in determining an impact's intensity.

It should be noted for context that, to provide a conservative approach to the analysis, the individual counties were selected as the ROI instead of the USEPA-designated Air Quality Control Region (AQCR), which covers a much larger area than the affected counties.

Calculated air emissions were compared to the annual total emissions of the appropriate counties (Okaloosa, Santa Rosa, Walton, Escambia, and Bay Counties) as represented in the 2002 National Emissions Inventory to identify impacts. Section 4.8 in the SEIS shows details of individual pollutant emissions associated with the construction activities, increased flight operations, munitions use, tactical vehicles, and the increases in personnel at the installation.

Greenhouse Gases

Greenhouse gases (GHGs) are gases that trap heat in the atmosphere. These emissions are generated by both natural processes and human activities. The accumulation of GHGs in the atmosphere regulates the earth's temperature. The U.S. Global Change Research Program report *Global Climate Change Impacts in the United States* states the following:

> Observations show that warming of the climate is unequivocal. The global warming observed over the past 50 years is due primarily to human-induced emissions of heat-trapping gases. These emissions come mainly from the burning of fossil fuels (coal, oil, and gas), with important contributions from the clearing of forests, agricultural practices, and other activities.

GHGs include water vapor, carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), ozone (O_3), and several hydrocarbons (HCs) and chlorofluorocarbons (CFCs). Each GHG has an estimated global warming potential (GWP), which is a function of its atmospheric lifetime and its ability to absorb and radiate infrared energy emitted from the earth's surface. The GWP of a particular gas provides a relative basis for calculating its CO_2-e (i.e., the amount of CO_2 that emissions of that gas would be equal to). CO_2 has a GWP of 1, and is, therefore, the standard by which all other GHGs are measured.

On February 18, 2010, the CEQ released its *Draft NEPA Guidance on Consideration of the Effects of Climate Change and Greenhouse Gas Emissions*, which suggests that proposed actions that would be reasonably anticipated to emit 25,000 metric tons or more of carbon dioxide-equivalent (CO_2-e) GHG emissions should be evaluated by quantitative and qualitative assessments. This is not a threshold of significance but a minimum level that would require consideration in NEPA documentation. The purpose of quantitative analysis of CO_2-e GHG emissions in the SEIS is for its potential usefulness in making reasoned choices among alternatives.

The potential effects of GHG emissions from the Proposed Action are by nature global. Given the global nature of climate change and the current state of the science, it is not useful at this time to attempt to link the emissions quantified for local actions to any specific climatological change or resulting environmental impact. Nonetheless, the GHG emissions from the No Action Alternative and the Proposed Action alternatives have been quantified to the extent feasible in the SEIS for information and comparison purposes. More information regarding GHG emissions can be found in the SEIS in Section 3.8, and estimates of GHG emissions from the No Action Alternative can be found in Section 3.8.5 and from the Proposed Action alternatives in Section 4.8 of the SEIS.

A public scoping comment raised a concern for air quality due to the increase in automobile traffic. Please see SEIS Section 3.8.5.

Personnel and Construction. Individual pollutant emissions from construction and personnel activities associated with the project would be minimal, not exceeding 1.6 percent of the total ROI emissions under any of the alternatives for each corresponding pollutant, despite a temporary increase in criteria pollutant emissions. The slight increase in local air quality emissions from construction activities would be temporary. Small increases in vehicular emissions from daily commutes and increases in public traffic are not expected to adversely impact overall air quality.

Flight Operations. Individual pollutant emissions from fight training activities associated with the project range would be minimal, not exceeding 1.65 percent of the total ROI emissions for each corresponding pollutant, despite a temporary increase in criteria pollutant emissions. There would be slight increases in particulate emissions due to munitions use on TAs C-52E and B-82. Minor increases would also occur on TA C-62 and B-75 due to the use of small arms and flares.

Although the emissions levels would vary slightly across the alternatives, the overall impacts to air quality from JSF flight training activities would be similar among the alternatives.

A summary of the total emissions (including construction, personnel activities, flight operations, and munitions) for the Proposed Action alternatives compared with the No Action Alternative is provided in Table ES–16**.** Details on the methodology and emission factors can be found in Section 3.8 and Appendix D, *Air Quality,* respectively of the SEIS.

Table ES–16. Summary of Emissions for Proposed Action and No Action Alternative

Alternative	Emissions (tons/year)					
	CO_2-e	CO	NO_x	PM_{10}	SO_2	VOCs
No Action	**139,328.67**	**572.17**	**531.06**	**463.06**	**63.18**	**49.44**
1A	139,328.10	558.86	499.40	462.96	62.77	49.44
1I	140,676.95	569.97	516.88	576.61	64.47	50.74
2A	162,983.91	643.09	576.98	324.36	71.80	48.32
2B	163,573.04	648.21	576.48	324.32	71.94	48.43
2C	167,360.48	682.28	581.52	324.87	73.28	48.95
2D	140,608.82	1,100.94	293.59	329.80	67.16	55.78
2E	162,098.58	609.51	582.27	324.39	71.68	46.29

CO = carbon monoxide; CO_2-e = carbon dioxide equivalent; NO_x = nitrogen oxides; PM_{10} = particulate matter with a diameter of less than or equal to 10 microns; SO_2 = sulfur dioxides; VOC = volatile organic compound

4.8 HEALTH AND SAFETY

The safety analysis in the SEIS (Section 4.9) addresses explosives safety, ground safety, and flight safety issues. Explosives safety relates to the management and use of ordnance or munitions associated with training activities. Ground safety considers issues associated with operations and maintenance activities that support range operations, including fire response. Ground safety also includes construction safety issues associated with development of the support facilities, expansion runways, and road improvements. Flight safety considerations include aircraft mishaps and Bird/Wildlife-Aircraft Strike Hazards (BASHs). The Air Force defines four categories of aircraft mishaps: Classes A, B, and C and High Accident Potential. Class A mishaps result in loss of life, permanent total disability, a total cost in excess of $1 million, or the destruction of an aircraft. The analysis focuses on Class A mishaps because of their potential to affect private property or the public. BASHs are also addressed, because these constitute a safety concern because of the potential for damage to aircraft or injury to aircrews or local populations if an aircraft crash should occur.

Construction. Under the No Action Alternative and Alternative 1A, facilities for ordnance storage would be constructed at the existing MSA and designed and fully licensed for the ordnance they store. Under Alternative 1I, creation of a taxiway and explosives transport route over a public highway would require careful planning and engineering to ensure that the safety of military personnel and the public is maintained. Alternative 2 would require construction of new explosives handling facilities. Additionally, Eglin AFB would develop and implement appropriate Explosive Safety Quantity Distances (ESQDs) to mitigate potential hazards associated with the storage of munitions.

Under the No Action Alternative and Alternative 1A, no unusual ground safety risks would be expected from ground operations or demolition/construction activities as current operational processes and procedures and industrial safety standards would be followed. For Alternative 1I, transport of live munitions and taxiing of military aircraft across a busy public highway would increase concerns of public safety. Fire response and EOD personnel would need to be made aware of any specific issues or techniques required for dealing with potential incidents involving this and other aircraft, as well as live ordnance. Under Alternative 2, any unique training associated with F-35 crash response would also have to be extended to personnel from local fire departments. Specific procedures are implemented for minimizing the risk of fire from range operations; therefore, implementation of these alternatives would not result in heightened ground safety concerns.

Flight Operations. Aircraft mishap rates associated with the newly developed F-35 have not been established. An increase in total air operations may lead to an increase in the occurrence of aircraft mishaps. However, current safety policies and procedures at Eglin are designed to ensure that the potential for aircraft mishaps is reduced to the lowest possible level. These safety policies and procedures would continue under the JSF flight training and would apply to all alternatives.

A few commenters shared their concern that student pilots would put people in the flight training area at a higher risk for damage from aircraft crashes. Please see SEIS Sections 4.9.1, 4.9.1.2, and 4.9.2.1 through 4.9.2.5, Flight Operations.

Under each of the alternatives, the number of total annual sorties for all aircraft at the base would increase, thus it is expected that the number of bird strikes per year may similarly increase. However, the overall risk associated with bird-aircraft strikes is expected to remain low. Under Alternative 1I, the expansion runway would be situated well within the FAA-recommended airfield siting separation distances for wetlands. Under Alternatives 2A, 2B, and 2C, the expansion runway would be incompatible with the FAA-recommended airfield siting separation distances for wetlands. Garnier Creek and Toms Creek are located near the runway under Alternative 1I. Honey Creek, Silver Creek, Juniper Creek, and Still Branch are located near the runway under Alternatives 2A, 2B, and 2C. These creeks are likely to attract birds and wildlife that could increase the BASH risk. However, through continued coordination with the U.S. Department of Agriculture (USDA) and by implementing an adaptive management process, which may require future mitigation measures to be put into practice, the selection of any of these alternatives would not present a significant increase in BASH.

4.9 SOLID WASTE

A commenter questioned if the transfer stations and landfills could handle the new capacity of waste. Please see SEIS Section 4.10.

Solid waste is defined in the Florida Solid Waste Disposal Facility regulations as any sludge (unregulated by the federal Clean Water Act or Clean Air Act), garbage, rubbish, refuse, special waste, or other discarded material resulting from domestic, industrial, commercial, mining, agricultural, or government activities. Solid waste includes wastes commonly referred to as municipal solid wastes (such as garbage and refuse) and construction and demolition (C&D) debris, which consists of discarded materials generally not soluble in water (steel, glass, brick, concrete, asphalt, etc.).

The evaluation for the SEIS was conducted as outlined in Section 3.9 of the FEIS for BRAC activities associated with the JSF operations. More details can be found in Section 4.10 in the SEIS.

Construction. Construction activities associated with the No Action Alternative are expected to generate approximately 244,911 tons of debris, a net increase of about 40 percent within the three-county ROI (Santa Rosa, Okaloosa, and Walton Counties) over three years. Annual debris under Alternative 1 would be the same as under the No Action Alternative. An additional 4,340 tons of debris would be generated under Alternative 1I, representing a net increase of 2.14 percent. For Alternatives 2A, 2B, and 2C, debris is estimated to be around 22,608 tons. This quantity of debris generation rate within the three-county ROI results in a net increase of 11 percent. Under Alternatives 2D and 2E, the amount of construction debris is estimated at 15,556 tons. This quantity of debris represents a net increase of the generation rate from the three-county ROI of 7.7 percent.

Flight Operations. Each of the proposed alternatives for the beddown of the JSF aircraft includes the potential for additional personnel, which increases the projected quantity of municipal solid waste generated at Eglin AFB and Duke Field. Municipal solid waste is estimated to be 6,418 tons annually. When compared to the average municipal solid waste generation rate within the three-county ROI, this results in a 3.2 percent increase. Additional quantities of metallic debris will be generated from maintenance and flight operations. It is anticipated that the bulk of the metallic debris will be collected and recycled.

4.10 HAZARDOUS MATERIALS AND HAZARDOUS WASTE

One commenter expressed concern for hazardous materials and hazardous waste management. Please see SEIS Sections 3.11 and 4.11.

Hazardous materials are identified and regulated under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA); Occupational Safety and Health Administration (OSHA) regulations; and the Emergency Planning and Community Right-to-Know Act (EPCRA). Hazardous materials have been defined in AFI 32-7086 *Hazardous Materials Management*, to include any substance with special characteristics that could harm people, plants, or animals. *Hazardous waste* is defined in the Resource Conservation and Recovery Act (RCRA) as any solid, liquid, contained gaseous or semisolid waste, or any combination of wastes that could or do pose a substantial hazard to human health or the environment. Waste may be classified as hazardous due to its toxicity, reactivity, ignitibility, or corrosivity. In addition, certain types of waste are "listed" or identified as hazardous in 40 CFR 261.

Management of hazardous wastes would be performed according to prescribed procedures already in place at Eglin AFB. Renovation/demolition of some of the buildings could result in the production of small amounts of lead-based paint (LBP) or asbestos wastes. Hazardous and nonhazardous waste would be generated as a result of maintenance functions associated with new aircraft on the base. Eglin AFB would establish new initial accumulation points (IAPs) at generation locations, and personnel managing these locations would be properly trained in waste management. No change to permits, hazardous waste generator status, or management procedures would be required.

Section 4.11 in the SEIS discusses in detail the environmental impacts of hazardous materials, hazardous waste, asbestos-containing materials (ACM), LBP, and Environmental Restoration Program (ERP) sites. For detailed information on the definition of the resource, applicable laws and regulations and analysis methodology, see the FEIS, Sections 3.10, 6.10, and 7.10.

Construction. Hazardous and nonhazardous wastes would be generated as a result of demolition, construction, and maintenance functions associated with new aircraft. Any ACM or LBP generated during renovation/demolition would be disposed of in accordance with state and federal regulations. No impacts are anticipated from the presence of the seven ERP sites located within the proposed footprint for the JSF IJTS and MSA. Any construction activities occurring near an existing ERP site would be coordinated with Eglin's Environmental Restoration Branch.

Flight Operations. Aircraft maintenance activities are expected to generate hazardous wastes similar to those currently produced in F-15 maintenance; therefore, Eglin is currently equipped to handle such wastes. Any unique hazards involved in maintaining the F-35 would require the implementation of appropriate hazardous waste controls to

minimize risks to personnel and the environment. Munitions-related debris would generate less hazardous waste debris than those in the FEIS and are similar to activities already conducted by other units on Eglin AFB; therefore, range clearance and disposal procedures currently in place would be sufficient. The hazardous wastes generated from munitions would not require new EPCRA Toxic Release Inventory (TRI) reporting. Flight operation impacts and munitions-related hazardous materials or wastes are similar under all alternatives and would have no adverse impacts.

One commenter expressed concern for the local watershed due to runoff. Please see SEIS Sections 4.12.1 and 4.12.2.

Fuel release events may occur within JSF flight training airspace during air-to-air refueling or in-flight emergencies in which fuel stores are jettisoned from the aircraft. However, this is not normal Air Force practice and is not done in the base airspace environment. In emergency situations, procedures require that fuel dumping be coordinated with Air Traffic Control and be conducted, to the extent possible, over water or unpopulated land areas at an altitude at least 5,000 feet above the highest obstacle (EAFBI [formerly AACI] 11-201, 28 July 2006). Please see SEIS Section 3.11 for more discussion on fuel release events.

4.11 PHYSICAL RESOURCES

Physical resources include topography, geology, soils, and water. Land disturbance and the creation of impervious surfaces (i.e., roads, buildings, and compacted soil) can magnify the potential for erosion. The key issue of concern is the potential for the transport of soils through erosion caused by stormwater runoff from increased impervious surface areas. Water resources include surface waters, wetlands, floodplains, coastal zones, and stormwater.

Eglin AFB has extensive water bodies. Erosion control measures would be instituted to reduce, to the extent possible, soils runoff into the waterways during construction.

Construction. Under all alternatives, there are no direct impacts to surface waters, wetlands, and floodplains due to construction, demolition, and renovation. Under Alternatives 2A, 2B, and 2C, the construction footprint for the proposed location of the parallel runway east of Duke Field does contain surface waters and wetland areas; however, there are no floodplains in that location. Construction over surface waters or within wetland areas would be avoided, and thus no direct impacts to surface waters and wetlands would occur. For all alternatives, the Coastal Zone Management Act (CZMA) Determination addresses impacts to coastal zone areas (see Appendix I, *CZMA Determination*, of the SEIS). Also, implementation of any of the proposed alternatives would increase the potential for an increased rate and volume of stormwater runoff, which would increase the amount of sediment and pollutant runoff into nearby surface waters, wetlands, and floodplains. However, the Air Force would obtain the necessary permits and would implement any

required site-specific management actions and best management practices (BMPs) so that no adverse impacts to water quality from construction activities would occur.

Flight Operations. The impacts resulting from flight operations on physical resources are the same across all alternatives. The increase in munitions expended would have no adverse effects on environmental factors within TAs B-75, C-62, C-52, C-72, and B-70. Current maintenance practices would not change, and the erosion is not expected to worsen as a result of JSF training.

4.12 BIOLOGICAL RESOURCES

The Eglin Reservation represents a protected habitat for many native species. The increased human presence and activity could affect, but would not be expected to adversely affect, sensitive species within the Eglin Reservation.

Biological resources include the native and introduced terrestrial and aquatic plants and animals found on and around Eglin AFB. The habitats of Eglin AFB are home to an unusually diverse biological community, including several sensitive species and habitats.

Construction. Areas of construction, already approved in the February 2009 ROD, are predominately urban/landscaped and located adjacent to the flight line with wildlife consistent with urban environments and no sensitive habitats. No direct adverse impacts would occur to flora, fauna, sensitive habitats, or sensitive species from any alternative.

One commenter expressed concern for the well-being of the red-cockaded woodpecker. Please see SEIS Sections 4.13.1 and 4.13.2.

Indirect impacts could occur to the Okaloosa darter stream north of the proposed JSF MSA expansion area (Toms Creek) as a result of sedimentation and runoff from the construction activities at the MSA. Erosion control measures such as silt fencing near Toms Creek would reduce potential runoff issues. A letter from the U.S. Fish and Wildlife Service (USFWS) indicates that any future developments impacting RCW inactive trees on Eglin Main Base are not likely to adversely affect the RCW.

Eglin has the largest contiguous acreage of old-growth longleaf pine in the world and the fourth largest red-cockaded woodpecker population.

Alternative 1A would take place in the same location as the No Action Alternative. Therefore, no adverse impacts would occur to flora, fauna, sensitive habitats, or sensitive species under Alternative 1A. Land clearing for JSF beddown construction under Alternative 1I would involve disturbing a small portion of high quality

habitat; however, most of the habitat is low quality Sandhills association, and ample quality habitat exists elsewhere on the Eglin Reservation. Therefore, no adverse impacts would occur to flora, fauna, sensitive habitats, or sensitive species under Alternative 1I. Garnier Creek is located immediately adjacent to the proposed expansion runway, and Toms Creek, an Okaloosa darter stream, is located about 1,700 feet from the proposed runway. Erosion control methods would be required to reduce potential runoff issues. Three inactive RCW trees would be removed during construction; however, Eglin Natural Resources biologists indicate there is extremely low potential for any of these clusters to become active due to the low quality of the habitat.

Alternatives 2A, 2B, and 2C would involve clearing approximately 250 acres of High Quality Natural Communities (HQNCs). The project area for Alternatives 2A, 2B, and 2C is approximately 1 mile from the nearest Okaloosa darter streams to the south and west. These alternatives would involve the clearing of 768 acres of RCW habitat, 5 active RCW trees, and 22 inactive trees. Eglin is currently implementing an active recruitment cluster program to grow the population to ensure that the potential loss of a few clusters would have no impact. At the population level and recovery unit level, the proposed tree clearing is not likely to adversely affect the RCW, and impacts to the RCW would not be significant. The Alternatives 2D and 2E project area consists of approximately 95 percent Sandhills ecological association, and none of the disturbed area is considered high quality or sensitive habitat. The nearest Okaloosa darter stream is approximately 1,000 feet south of the project area. There is sufficient vegetative buffer in the area between, so it is not likely that the stream would be affected adversely. There are four inactive RCW trees that would be removed during land clearing and construction. The nearest active RCW cluster is over a mile away from the proposed site, the quality of the habitat within the site is poor. There is ample suitable habit availability elsewhere, so construction and daily activities are not likely to adversely affect the RCW at this site. A reduction in prescribed fire would occur in the proximity of all Alternative 2 sites and in the areas along the access roads. Although there would be a reduction in acreage and degradation of certain sensitive habitats, similar habitats exist on other portions of Eglin and would continue to be maintained. Overall, impacts to these sensitive habitats would not be significant for any of the Alternative 2 locations.

Up to 95 percent of the Okaloosa darter's habitat falls within the watershed of six streams on Eglin, the rest on neighboring land, and nowhere else on Earth.

Flight Operations. Ground movements by aircraft would only occur on established air fields; therefore, no impacts from air operations would occur to sensitive habitats. Since aircraft are already a major component of the existing noise environment at Eglin, aircraft noise from the alternatives would not pose a novel or new threat to birds and wildlife that would cause adverse reactions other than temporary flight. Thus, noise from the air operations would not adversely affect protected species. Direct impacts to sensitive habitats and species as the result of munitions are unlikely; however, some increased risk of wildfire would result from munitions use. For JSF training, wildfire operational plans would be developed with Eglin's Natural Resources Section to identify high wildfire risk conditions and notification procedures that units would follow to engage fire response personnel when needed. Munitions use would follow Eglin's Wildfire Specific Action Guide Restrictions. Noise impacts to the RCW and bald eagle would be possible; however, RCWs and eagles continue to thrive near noisy test areas, indicating that habitat quality seems to be more influential in determining productivity, survival, and population stability than noise. The RCW is not likely to be adversely affected. Impacts to sensitive habitats and species from munitions use would not be adverse. Eglin is conducting an Endangered Species Act (ESA) Section 7 consultation with the USFWS. Domestic animals are not expected to be impacted by increased aircraft noise under any alternative.

One commenter expressed concern that there would be noise cruelty to pets and wildlife. Please see SEIS Sections 4.13.1 and 4.13.2.

The F-15, pictured here, has been operating in Eglin airspace for decades. The F-35 is similar in size and performance, and is not expected to adversely impact biological resources.

4.13 CULTURAL RESOURCES

Cultural resources consist of prehistoric and historic sites, structures, artifacts, and any other physical or traditional evidence of human activity considered relevant to a particular culture or community for scientific, traditional, religious, or other reasons. As defined under 36 CFR 800.16(l)(1), "Historic Property means any prehistoric or historic district, site, building, structure, or object included in, or eligible for inclusion in, the National Register of Historic Places (National Register) maintained by the Secretary of the Interior. This term includes artifacts, records, and remains that are related to and located within such properties. The term includes properties of traditional religious and cultural importance to an

The Eglin Field Historic District contains 20 structures established during World War II, such as the one pictured above.

Indian tribe or Native Hawaiian organization and that meet the National Register criteria."

For an extensive description of this resource, installation history, laws and regulations, and methodology, please refer to Appendix F and Section 3.13 of the FEIS. An amendment to the project-specific programmatic agreement to address the National Historic Preservation Act (NHPA) Section 106 process was signed in 2011 and is provided in Appendix F, *Cultural Resources*.

Construction. No adverse effects to cultural resources would be expected under Alternative 1A for construction activities. No historic properties considered eligible for listing on the National Register are located within this alternative area. Adverse effects to cultural resources would not be expected under this alternative. Adverse effects to cultural resources would occur from construction activities under Alternative 1I. One NRHP-eligible historic homestead (8OK2750) does fall within this area and will require avoidance if possible or data recovery and other mitigation as needed. Adverse effects to cultural resources would occur from construction under Alternatives 2A, 2B, and 2C. One archaeological site (8OK333) considered eligible for listing on the National Register is present within the area of potential effect under Alternatives 2A, 2B, and 2C. The Air Force will attempt to avoid site 8OK333 in accordance with the amended programmatic agreement. If adverse effects are expected to occur to these archaeological sites, additional consultation under provisions of the project-specific programmatic agreement will be conducted to devise a plan to protect the sites or to otherwise mitigate for adverse effects. No adverse effects to cultural resources are expected under Alternatives 2D or 2E as no historic properties considered eligible for listing on the National Register are located within these areas. Should archaeological deposits be discovered during construction, however, Eglin AFB will follow the provisions for unanticipated discoveries provided for in the Eglin AFB *Integrated Cultural Resources Management Plan* (U.S. Air Force, 2006) as well as stipulations of the amended project-specific programmatic agreement.

A concern was raised for the residents of homes on the Historic Registry. Please see SEIS Section 4.14.

Flight Operations. No adverse effects to cultural resources are expected to occur from flight training activities unless increased aircraft noise results in the abandonment of a building or structure. Adverse effects may occur from munitions use if avoidance of eligible resources is not feasible. Stipulations concerning these assessments of effects and resolution of adverse effects may be found in the Programmatic Agreement between Eglin AFB, the JSF Program, 7SFG(A), and the Florida State Historic Preservation Officer (SHPO) from the FEIS and the amended project-specific Programmatic Agreement for the SEIS.

5. MITIGATIONS

The mitigation measures discussed in an EIS or SEIS cover a range of issues generally addressing mitigation measures applied in the design of reasonable alternatives (i.e., mitigation by avoidance) or address mitigations not included in the design, but applied after the impact analysis. Mitigation measures are considered even for impacts that, by themselves, would not be considered "adverse." The Eglin AFB BRAC 2005 proposal is considered as a whole to address specific effects on the environment (regardless of the level of the impacts), and mitigation measures are developed where it is feasible to do so.

CEQ regulations (at 40 CFR 1508.20) define mitigation in the following five ways:

1. **Avoiding** the impact altogether by not taking a certain action or parts of an action
2. **Minimizing** impacts by limiting the degree or magnitude of the action, and its implementation
3. **Rectifying** the impact by repairing, rehabilitating, or restoring the affected environment
4. **Reducing or eliminating** the impact over time by preservation and maintenance operations during the life of the action
5. **Compensating** for the impact by replacing or providing substitute resources or environments

During the initial development of this project, mitigation and management measures were included in the design parameters. This meant that avoiding, minimizing, or reducing potential impacts was a priority guiding the development of alternatives. These mitigation and management measures, which are incorporated into the overall design of the alternatives, include BMPs.

A mitigation plan will be developed in accordance with 32 CFR 989.22(d). The mitigation plan will be developed to address specific mitigations that the proponents of various actions will implement if selected in the ROD. The mitigation plan, for example, will also include a *Storm Water Pollution Prevention Plan* and a *Spill Prevention, Control, and Countermeasures Plan* or updates to these plans specific to the alternative selected. These plans are in addition to and complement any permits that may be issued to implement BRAC actions at Eglin AFB.

Table ES–17 identifies proposed measures to reduce the potential for environmental impacts. The table presents the measures by resource area and alternative.

Table ES–17. Potential Mitigations and Management Measures

Resource Area/ Alternative	Mitigations and Management Measures
Airspace	
1A 1I 2A 2B 2C 2D 2E	This SEIS incorporates the following recommendations from the Gulf Regional Airspace Strategic Initiative (GRASI) report (U.S. Air Force, 2011a): • **Utilization of additional special use airspace (SUA):** Additional non-Eglin-controlled airspace was incorporated to expand training opportunities. Additional SUA units evaluated include Camden Ridge/Pine Hill, Carabelle East/West, Compass Lake, Desoto/Restricted Area R-4401, Warning Area W-155, and Moody. • **Relocation of some simulated flameout operations:** Simulated flameout approaches have been shifted from Eglin Main Base and Duke Field to Choctaw Field and Tyndall AFB to improve airspace in the North/South corridor. • **Creation of four new Air Traffic Control assigned airspaces (ATCAAs):** Four new ATCAAs are currently being established. • **Efficient use of airspace over R-2915 and R-2914:** This recommendation involves utilizing a new scheduling tool that would track and compare scheduled airspace with airspace actually utilized in order to increase efficiency and allow for more flexibility. Several other recommendations provided during the GRASI study could help improve overall congestion in the region and aid air traffic controllers in their decision making process. These recommendations are as follows: • **Establishment of standard instrument departures (SIDs) and standard terminal arrival routes (STARs):** This involves establishing, through coordination with other locations, route entry points for east-west aircraft traffic over shoreline airspace for ascent and descent in order to increase efficiency. • **Locating remote emitters outside of restricted areas:** At this time no decision has been made and no locations have been identified for potentially locating remote emitters outside of restricted airspace. • **Expanding operating hours to six days per week:** A study is currently being conducted on the feasibility of operating six days a week; however, a decision has not yet been made. • **Establishing new partnerships for landscape-scale training:** Landscape-scale training involves utilizing non-military airspace and compatible private, local, state, and federal lands for nonhazardous missions. A year-long study to identify requirements and opportunities for increased mission capability and flexibility was started in April 2012. • **Evaluating North Pensacola Military Operating Area (MOA) reorganization:** Reorganizing the North Pensacola MOA is currently being evaluated by the Navy for feasibility. • **Creating a new munitions impact area:** At this time no areas have been identified for a potential new munitions impact area. Separate analysis, if required by the National Environmental Policy Act (NEPA), would be conducted upon the decision to create a new munitions impact area.

Table ES–17. Potential Mitigations and Management Measures, Cont'd

Resource Area/ Alternative	Mitigations and Management Measures
	• **Creating a regional control facility:** There are no plans at this time to implement this recommendation. Separate NEPA analysis, if required, would be conducted upon the decision to construct a regional control facility.
Noise	
1A 1I 2A 2B 2C 2D 2E	Mitigations that have been incorporated into all of the alternatives, including Alternative 1A (the Preferred Alternative), in this SEIS are as follows: • Substantially reduced the number of total operations from what was analyzed in the FEIS and the 2010 Draft SEIS • Reduced the number of flights on RW 01/19 from what was analyzed in the FEIS and the 2010 Draft SEIS • Use of Practice Instrument Approach Fields (PIAFs) to reduce Instrument Landing System (ILS) use of RW 01/19 • Changed the flight profiles for all three F-35 variants • Changed the flight tracks for the Navy and Marines F-35 aircraft • Adjusted arrival and departure procedures • Reduced from the FEIS the number of "late night" (between 10:00 PM and 7:00 AM) flights • Use of flight simulators for some training The alternatives described in this SEIS were designed with noise impacts in mind. Additionally, two new alternative beddown locations with no flights on Runway (RW) 01/19 were added and analyzed. With the exception of Alternative 1A, all of the alternatives would involve relocating some percentage of the F-35 aircraft operations from the existing runways at Eglin Main Base to runways that are surrounded by fewer noise-sensitive land uses. Implementing certain alternatives would result in substantially reduced noise impacts. In furtherance of NEPA's Section 101 goals to "protect, restore, and enhance the environment" (40 Code of Federal Regulations [CFR] 1500.1(c)), the Air Force will implement an adaptive management approach to basing the F-35 aircraft and standup of the JSF Initial Joint Training Site (IJTS). Adaptive management allows for improving an understanding of complex, interrelated systems through a long-term process built around a continuous cycle of experimentation, evaluation, learning, and improvement over time. The ability to experiment and test hypotheses in a time frame that allows meaningful data to be gathered and evaluated is an important element of that process. The area around Eglin AFB is a dynamic system that is continually evolving: it is likely that there will be unanticipated changes in baseline conditions, that new information may become available, or that the effectiveness of mitigation measures may be different than expected. Adaptive management techniques are well suited to such circumstances. Some adaptations may require additional NEPA analysis, such as those that would result in a substantial change to the action. Thus, the post-Record of Decision (ROD) mitigation plan will include an adaptive management program incorporating (for

Table ES–17. Potential Mitigations and Management Measures, Cont'd

Resource Area/ Alternative	Mitigations and Management Measures

	example) the following kinds of adaptive management approaches:
	• Noise modeling: Supplement existing data with new noise data as it is being developed in the future. Use new data to reveal and understand the potential effects of activities or practices that are underway or being considered for implementation in the F-35 IJTS ramp up to final operational capability and thereafter. Make changes to improve mitigations and related actions.
	• Management and oversight: Monitor and evaluate results of earlier predictions. Develop and implement adaptations to eliminate or reduce effects. Specific aspects of flying at Eglin AFB that will be regularly re-examined include, but are not limited to:
	  • Modify ground tracks used by aircraft to avoid noise-sensitive areas to a greater degree.
	  • Modify altitude, engine power setting, and airspeed profiles used by the JSF to reduce impacts to noise-sensitive areas.
	  • Modify the JSF training plan, as more experience is gained with training pilots on the JSF, to minimize any training event requirements that are not absolutely necessary for pilot combat readiness.
	  • Noise impacts may be reduced with the construction of an ILS and precision approach radar on any newly constructed runways. However, conducting routine instrument approaches to Eglin Main RW 12 would have a significant impact on Air Force Special Operations Command (AFSOC) operations and the usage of Restricted Area R-2915A.
	• New knowledge and information: Through experimentation, knowledge and information can be incorporated into management options and recommendations.
	
	The following additional steps will also be part of the mitigation plan for the selected Alternative:
	• Identifying the type of monitoring for the action and each mitigation
	• Delineating how the monitoring will be executed
	• Identifying who will fund and oversee its implementation
	• Establishing the process and responsibilities for identifying and making changes to the action or mitigations to influence beneficial results or avoid/reduce adverse ones

Table ES–17. Potential Mitigations and Management Measures, Cont'd

Resource Area/ Alternative	Mitigations and Management Measures
Land Use	
1A 1I 2A 2B 2C 2D 2E	Because most of the potential impacts to land use are directly related to noise from the F-35 flight operations, please see mitigations related to noise. These mitigations may help ensure that incompatible land use impacts are mitigated as well. No specific land use mitigations have been identified at this time. However, should appropriate mitigations be identified through the adaptive management process the Air Force may choose to implement them at that time.
Socioeconomics	
1A 1I 2A 2B 2C 2D 2E	Because most of the potential impacts to socioeconomics are directly related to noise from the F-35 flight operations, please see Section 4.3.4 in the SEIS for mitigations related to noise. These mitigations may help ensure that impacts to socioeconomics are mitigated as well. No specific socioeconomics mitigations have been identified at this time. However, should appropriate mitigations be identified through the adaptive management process, the Air Force may choose to implement them at that time.
Transportation	
1A 1I 2A 2B 2C 2D 2E	The demand on several roadways equates to the need for six lanes or more. However, an improvement for six lanes or more may not be feasible for many reasons, including right-of-way availability, safety concerns, cost, etc. Other improvements that should be considered include Congestion Management System (CMS) and Transportation System Management (TSM) projects, a corridor management plan that looks at access along the corridor, and transit improvements.
Utilities	
1A 1I 2A 2B 2C 2D 2E	No Mitigations

Table ES–17. Potential Mitigations and Management Measures, Cont'd

Resource Area/ Alternative	Mitigations and Management Measures
Air Quality	
1A 1I 2A 2B 2C 2D 2E	No Mitigations
Health and Safety	
1A 1I 2A 2B 2C 2D 2E	No Mitigations
Solid Waste	
1A 1I 2A 2B 2C 2D 2E	No Mitigations
Hazardous Materials	
1A 1I 2A 2B 2C 2D 2E	No Mitigations

Table ES–17. Potential Mitigations and Management Measures, Cont'd

Resource Area/ Alternative	Mitigations and Management Measures
Physical Resources	
1A 1I 2A 2B 2C 2D 2E	To minimize the potential for impacts to groundwater, wetlands floodplains, and other surface water resources in interstitial areas, the following management requirements would be employed: • Do not alter natural flow patterns of streams by diverting water, causing siltation, or damming any portion of the stream or its tributaries. • Vehicles and equipment must stay a minimum of 50 meters (164 feet) from the edge of slopes leading down to streams. • For permitted off-road vehicle use: Do not drive vehicles in or across streams except at designated crossing points. • Tree clearing of any species is not permitted unless approved by Eglin Natural Resources Section. • Install and maintain entrenched silt fencing and hay bales along the perimeter of the construction site prior to any ground-disturbing activities and maintain them in effective, operating condition prior to, during, and throughout the entire construction process to prevent fill material, pollutants and runoff from entering wetlands or other surface waters. • Maintain at least a 100-foot vegetated buffer between construction sites and surface waters. • Incorporate a monitoring plan, especially after rain events, to observe the effectiveness of silt fencing, hay bales, and/or other erosion and sedimentation control devices and address modification as needed. Any failures would be carefully examined and corrected to prevent reoccurrence. • Sequence construction activities to limit the soil exposure for long periods of time. • Vegetate cleared/disturbed areas with native vegetation and grasses or mulch when the final grade is established to reduce/prevent erosion. • Where applicable, reduce erosion using rough grade slopes or terrace slopes. • Identify areas of existing vegetation that the proponent would retain and not disturb by construction activities. • Chemicals, cements, solvents, paints, or other potential water pollutants would be stored in locations where they cannot cause runoff pollution. • Any repairs, maintenance, and use of construction equipment (i.e., cement mixers) would take place in designated "staging areas" designed to contain any chemicals, solvents, or toxins from entering surface waters. • Stabilize construction site entrance using Florida Department of Transportation (FDOT)-approved stone and geotextile (fiber fabric). • Incorporate 10-year storm events into the design of facilities.

Table ES–17. Potential Mitigations and Management Measures, Cont'd

Resource Area/ Alternative	Mitigations and Management Measures
(Physical Resources, cont'd)	• Do not utilize septic tanks. • Equip all work sites with adequate waste disposal receptacles for liquid, solid, and hazardous wastes to prevent construction and demolition debris from leaving the work site. • Utilize proper site planning, low-impact design principles, and adequately engineered stormwater retention ponds (or swales) to manage stormwater (on-site) and prevent discharges into nearby surface waters. The design would take into consideration the landscape of the area and physical features to determine whether a retention pond or series of swales would be used to contain runoff. In accordance with Florida Department of Environmental Protection (FDEP) regulations, a Florida-registered Professional Engineer would design the proposed retention feature. • Incorporate into the design and construction of paved surface areas a slope sufficient enough to direct potential runoff away from wetland areas. Design and construct all drainage improvements and related infrastructure in such a manner that the natural hydrologic conditions would not be severely altered. • Do not use wetlands and other water bodies as sediment traps. • Design open channels and outfall ditches to include plans so that they do not overflow their banks. • Where flow velocities exceed 2 cubic feet per second, provide ditch pavement or other permanent protection against scouring. Revegetate all ditches not protected with a permanent material to provide an erosion resistant embankment. • Treat runoff from parking lots to remove oil and sediment before it enters receiving waters. • Provide all construction personnel with proper training regarding all management techniques.

Table ES–17. Potential Mitigations and Management Measures, Cont'd

Resource Area/ Alternative	Mitigations and Management Measures
Biological Resources	
1A 1I 2A 2B 2C 2D 2E	There are existing operating constraints based on current agreements with the U.S. Fish and Wildlife Service (USFWS) for threatened and endangered (T&E) species protection. Additionally, all Terms and Conditions resulting from the current BRAC Section 7 consultation with the USFWS will be implemented. • Immediately prior to clearing, conduct surveys for gopher tortoises and indigo snakes. If any animals are found relocate them to another area on Eglin according to Florida Fish and Wildlife Conservation Commission (FWC) guidelines. • Provide project personnel with a description of the eastern indigo snake, including information on its behaviors, its protection under federal law, and instructions not to injure, harm, or kill this species. • Direct personnel to cease any activities if a black bear, indigo snake, or gopher tortoise is sighted and allow the animal sufficient time to move away from the site on its own before resuming any activities. Immediately contact Eglin's Natural Resources Section (NRS). • Discourage human-bear interactions by responsibly handling waste and employing measures such as bear-proof dumpsters and bear-resistant garbage cans. • Restrict vehicles to established roads and paved areas. • Maintain at least a 100-foot vegetated buffer along Okaloosa darter and Florida bog frog streams. • Utilize erosion control measures such as silt fencing near Okaloosa darter stream and Florida bog frog streams. • To reduce potential seed sources, treat areas with known invasive nonnative species problems. • To avoid spreading invasive nonnative species, do not drive vehicles in areas with known invasive nonnative species problems. If a vehicle is driven in such an infested area, clean the vehicle before it is driven to a noninfested area. • Use only native plants for landscaping. • Restrict low-level aircraft flights within 1,000 feet (vertically) of the eagle nest on Eglin Main Base during the breeding season (October 1 to May 15). • Develop wildfire operational plans with Eglin's NRS to identify high wildfire risk conditions and notification procedures that units would follow to engage fire response personnel when needed. • Follow Eglin's Wildfire Specific Action Guide Restrictions (U.S. Air Force, 2006a). • Continue monitoring of red-cockaded woodpeckers (RCWs) in the area by Eglin's NRS. • If tree clearing were to occur during nesting season, screen each inactive cavity tree during the breeding season to verify no trees have been recolonized. • Continue prescribed burning as much as possible in RCW foraging habitat. • Minimize the placement of targets on sloped areas.

Table ES–17. Potential Mitigations and Management Measures, Cont'd

Resource Area/ Alternative	Mitigations and Management Measures
Cultural Resources	
1A 1I 2A 2B 2C 2D 2E	The Air Force would incorporate protection or mitigation measures provided through an amended National Historic Preservation Act (NHPA) Section 106 project-specific programmatic agreement (refer to Appendix F, *Cultural Resources*); which generally includes the following: • Use highly visible avoidance measures, such as flagging, tree or vegetation planting, temporary fencing, removable barriers, signage or gating and permanent barriers around the recorded limits of cultural sites. • Map the location of all archaeological sites and historic buildings and describe avoidance measures for each. • Coordinate with user groups to communicate the importance of protecting cultural resources and how to identify and avoid impacting them. This includes determining what markings, maps, briefings would be most effective to ensure avoidance of historic properties. • Data recovery, architectural treatment, or alternative mitigation methods conducted by a qualified individual and coordinated with the State Historic Preservation Officer (SHPO). The Air Force would incorporate protection or mitigation measures for historic structures provided through an amended NHPA Section 106 project-specific programmatic agreement (refer to Appendix F); which generally includes the following: • Address anticipated adverse effects of demolition by updating appropriate forms, compiling electronic photos and blueprints, and communicating with the public. • Accomplish all demolition using qualified individuals and coordinate directly with the SHPO. • Avoid and preserve in-place, whenever possible, all archaeological sites that are either determined to be or potentially be eligible for listing on the National Register of Historic Places (the National Register), or follow the appropriate stipulations and procedures to resolve adverse effects. • If, as a result of aircraft noise, Eglin proposes to change the use of buildings that contribute to or are National Register-eligible structures, determine whether the structure serves its historic purpose and whether the use is important to its significance. If both criteria are met, consult with SHPO and possibly enter into a Memorandum of Agreement regarding treatment of adverse effect.

6. SUMMARY OF IMPACTS

This section summarizes the environmental impacts of each Proposed Action alternative and the No Action Alternative conditions. Each of the alternatives has differing environmental consequences, as described in the SEIS and summarized in this Executive Summary. Figure ES–19 is a color chart that depicts the results of the analysis contained in the SEIS. The colors represent the following:

- Green – May include some beneficial or adverse environmental consequences, but overall neither beneficial nor adverse
- Yellow – Potential adverse environmental consequences or burdens on the resource, or issues with the resource have been identified
- Red – Unavoidable adverse environmental impact

Boxes with multiple colors represent a designation between two of the categories listed above. Some of the impacts would fall into one category, with others in a different category. Therefore, it is not certain what the overall impact to the resource would be.

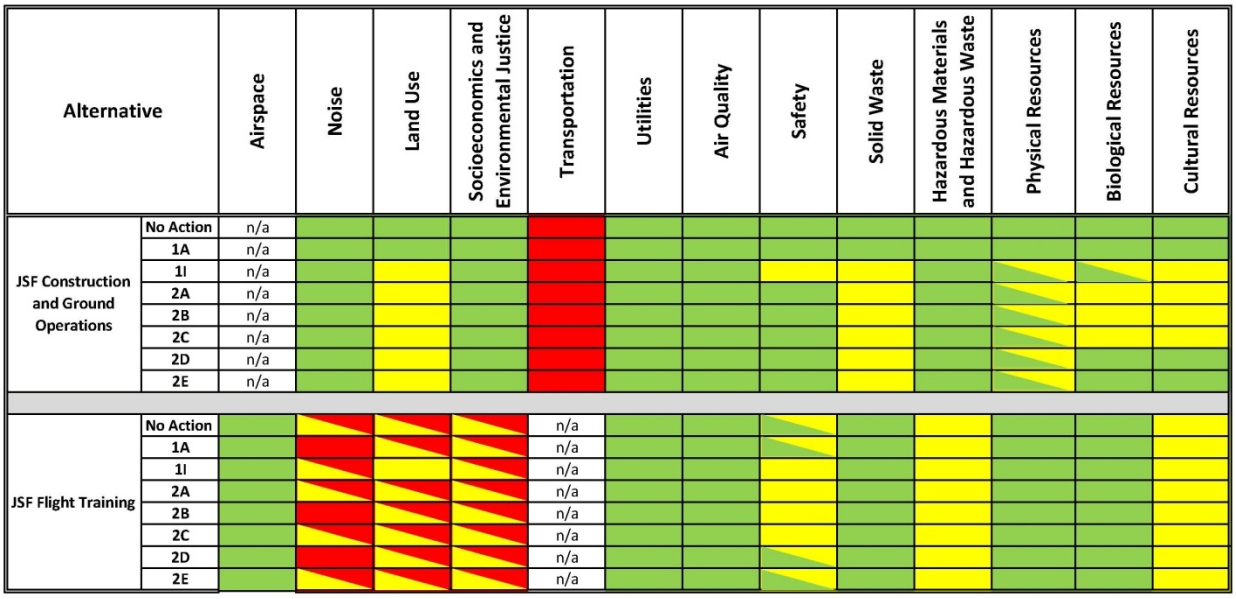

Figure ES–19. Summary of Impacts

Environmental consequences for each of the alternatives are summarized in this section. In each case, the No Action Alternative conditions are presented first, followed by the estimated environmental effects for JSF construction and ground operations as well as flight operations.

Each color on the chart is derived from analysis presented in the SEIS. The summary below identifies the conditions for each decision and briefly explains the reason for the color on the chart. Section 6.1 discusses construction and ground operations impacts, and Section 6.2 discusses impacts from flight operations. The color coding reflects mitigations required by regulatory/permits (e.g., stormwater permits). These "permit mitigations" would be implemented with any selected alternative.

6.1 CONSTRUCTION AND GROUND OPERATIONS

- The JSF construction and ground operations alternatives are located within Eglin AFB and do not affect airspace. The flight training alternatives affect airspace and are discussed in Section 6.2.
- Noise from construction and personnel activities (designated green across all action alternatives) would be comparable to the No Action Alternative.
- Construction-related land use impacts associated with the No Action Alternative and Alternative 1A were previously authorized by the February 2009 ROD; therefore, those have been designated as "green." All other alternatives have been specified as yellow due to acreage removal.
- The JSF construction and ground operations are not expected to substantively change socioeconomics or environmental justice. Additional construction would be expected to stimulate regional economic activity; therefore, the socioeconomics and environmental justice resource area is designated as "green."
- Transportation includes a large number of road segments that do not meet designed service levels. The addition of personnel associated with the JSF construction would contribute to increased traffic and would continue the unavoidable adverse impact. Transportation is designated "red" for all alternatives. Regional transportation is a continuing problem and will require a regional solution.
- Potable water and wastewater would remain within permitted limits under all alternatives, and although construction of additional infrastructure will be required, increased electricity and natural gas consumption would not cause an adverse effect to the northwest Florida supply. In fact, construction of any of the alternatives would improve on-base utilities with additional infrastructure. Base utilities would be within permitted levels and are designated as "green."
- For air quality, individual pollutant emissions from construction and ground operations would be minimal. The slight increase in air emissions would be temporary, and air quality emissions are not expected to change the region's air quality attainment status. Therefore, air quality is specified as "green" across all alternatives.

- For the No Action Alternative and Alternatives 1A, 2A, 2B, 2C, 2D, and 2E safety is identified as "green." Any ordnance storage facility that is constructed will be designed and fully licensed for the ordnance stored. Eglin AFB will also implement ESQDs to mitigate any potential hazards. Under Alternative 1I, safety is considered "yellow" because the construction of a taxiway and explosives transport route over a busy public highway would create additional hazards to both military personnel and the public.
- The JSF IJTS-related construction would require substantial building demolition and renovation. This and additional population would increase the amount of solid waste. Alternative 1I and Alternative 2 would generate more solid waste during construction than the other alternatives. Solid waste is designated as "yellow" for Alternatives 1I, 2A, 2B, 2C, 2D, and 2E.
- Any increase in the amount of hazardous wastes, particularly lead-based paint and asbestos would be disposed of in accordance with state and federal regulations. Development near any ERP site would be coordinated with Eglin's Environmental Restoration Branch. Hazardous materials and waste are designated as "green."
- Under the No Action Alternative and Alternative 1A, no water resources are impacted; therefore those alternative are "green." Alternatives 1I, 2A, 2B, 2C, 2D, and 2E are designated "green/yellow." Implementation of the Proposed Action would increase the amount and rate of stormwater runoff.
- Biological resources associated with the JSF beddown construction and ground operations are habituated to an urban setting and are not expected to be impacted under the No Action Alternative and Alternative 1A. Toms Creek is approximately 700 feet from these alternatives, and the Okaloosa darter may be, but is not likely to be, adversely affected by surface runoff. Both alternatives are designated as "green." Alternative 1I is identified as "green/yellow" because land clearing would disturb a small portion of high quality habitat. Alternatives 2A, 2B, and 2C are specified as "yellow" due to clearing up to 251 acres of high quality habitat as well as five active RCW trees. Alternatives 2D and 2E are designated as "green" because the disturbed area is not considered high quality habitat and no impacts to the Okaloosa darter or RCW would be expected.
- Adverse effects on cultural resources would be expected under Alternatives 1I, 2A, 2B, and 2C, which are specified as "yellow." All other alternatives are "green" and have no expected adverse effects.

6.2 FLIGHT OPERATIONS

- JSF flight training operations associated with the action Alternatives would impact air traffic controller workload and would contribute to increased congestion (air and

ground delays) for military and civilian aircraft across the region. However, the Alternatives would include the implementation of GRASI recommendations as described in the SEIS Sections 1.2.6, 2.3.4, and 2.3.5, which would enhance Air Traffic Control flexibility and decision making to relieve some of the burden on air traffic controllers. GRASI recommendations also will help alleviate air and ground delays for military and civilian aircraft across the region. Conclusions in the GRASI strategic plan state that if the final set of recommendations are undertaken and approved by the FAA, it will "ensure a near optimum use of airspace by civilians and the military" (U.S. Air Force, 2011a).

- Noise levels from F-35 training would represent an unavoidable adverse impact on residents and sensitive receptors under the expanded noise contours. Noise is "red" for Alternatives 1A, 2B, and 2D because these alternatives would affect the highest number of people off of the installation. All other alternatives are designated "red/yellow" because they would still have unavoidable adverse impacts on residents but would affect fewer people.
- Land uses currently under the runway approaches are under high levels of noise. The increased noise levels associated with the F-35 are expected to affect recommended land uses in adjacent communities. Unavoidable adverse noise impacts would affect land uses near Choctaw Field, Duke Field, and especially in the vicinity of the Eglin Main Base. Land use is "yellow/red" for all alternatives except Alternative 1I because noise exposures at Eglin Main Base would affect smaller areas of Valparaiso and Niceville as a result of the heavier use of the new runway.
- Socioeconomics and environmental justice issues associated with JSF flight training over adjacent communities, on MTRs, and within SUA would impact populations, schools, and other noise-sensitive receptors. Socioeconomics and environmental justice were designated as "red/yellow" for all flight training alternatives, because at least one school or daycare center is affected by noise greater than 75 dB DNL under each alternative.
- Transportation would not be affected by JSF flight operations.
- Utilities would not require extensive development to support JSF flight training. Potable water, wastewater, and electrical infrastructure are currently available at target locations and at auxiliary fields. Utilities are designated as "green."
- Air quality attainment status is expected to continue with the JSF flight training. Aircraft emissions and particulate matter from munitions are not expected to create pollution levels that would exceed air quality standards. Air quality is designated as "green."

- The increase in the number of operations would increase the risk of aircraft mishaps and BASH risks. Through the continued implementation of current safety policies and procedures, however, the potential impacts to health and safety under the No Action Alternative, Alternatives 1A, 2D, and 2E are designated as "green/yellow." There is an increased risk of BASH under Alternatives 1I, 2A, 2B, and 2C due to the proximity of creeks to the runway; therefore, those alternatives are "yellow."
- Solid wastes would be expected to increase from personnel and flight/maintenance activities. The increase in municipal solid waste would be minimal, and the bulk of metallic debris would be recovered and recycled. A "green" designation was given for all of the alternatives.
- Aircraft maintenance activities would generate hazardous waste. Hazardous wastes are not expected to exceed threshold levels for any new chemicals. Hazardous materials and hazardous wastes are designated as "yellow."
- There would be no impacts to physical resources from flight training activities. Physical resources are designated as "green."
- Impacts to biological resources from JSF flight operations or munitions use are unlikely. Therefore, all of the alternatives are designated as "green."
- No adverse effects to cultural resources are expected to occur from flight training activities unless increased aircraft noise results in the abandonment of a building or structure. Adverse effects may occur from munitions use if avoidance of eligible resources is not feasible. Therefore, cultural resources are designated as "yellow" for all alternatives.

ACRONYMS

7SFG(A)	7th Special Forces Group (Airborne)
96 TW	96th Test Wing
ACC	Air Combat Command
ACM	Asbestos-Containing Material
AETC	Air Education Training Command
AFB	Air Force Base
AFI	Air Force Instruction
AGL	Above Ground Level
AICUZ	Air Installation Compatible Use Zone
AMU	Aircraft Maintenance Unit
APZ	Accident Potential Zone
AQCR	Air Quality Control Region
ATCAA	Air Traffic Control Assigned Airspace
BAG	Basic Air to Ground
BASH	Bird/Wildlife-Aircraft Strike Hazards
BMP	Best Management Practice
BRAC	Base Realignment and Closure
C&D	Construction and Demolition
CAS	Close Air Support
CDNL	C-weighted Decibels, Day-Night Average Sound Level
CEQ	Council on Environmental Quality
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	Code of Federal Regulations
CMS	Congestion Management System
CTOL	Conventional Take-Off and Landing
CV	Carrier Variant
CY	Calendar Year
CZMA	Coastal Zone Management Act
DB	Decibels
DNL	Day-Night Average Sound Level
DoD	Department of Defense
EAFBI	Eglin Air Force Base Instruction
EIS	Environmental Impact Statement
EOD	Explosive Ordnance Disposal
EPCRA	Emergency Planning and Community Right-to-Know Act
ERP	Environmental Restoration Program
ES	Executive Summary
ESA	Endangered Species Act
ESQD	Explosive Safety Quantity Distance
FAA	Federal Aviation Administration
FDEP	Florida Department of Environmental Protection
FDOT	Florida Department of Transportation
FEIS	Final Environmental Impact Statement
FWC	Florida Fish and Wildlife Conservation Commission
GBU	Guided Bomb Unit
GHG	Greenhouse Gas
GRASI	Gulf Regional Airspace Strategic Initiative
GWP	Global Warming Potential
HQNC	High Quality Natural Communities
Hwy	Florida Highway
I-10	Interstate 10
IAP	Initial Approach Pattern
IJTS	Initial Joint Training Site
JDAM	Joint Direct Attack Munitions
JPO	Joint Program Office
JSF	Joint Strike Fighter
LBP	Lead-Based Paint
L_{dnmr}	Onset-Rate Adjusted Monthly Day-Night Average Sound Level
LHA	Landing Helicopter Amphibious
LOS	Level of Service
MILCON	Military Construction
MJU	Munitions Countermeasures Unit
mm	Millimeter
MOA	Military Operating Area
MRTFB	Major Range Test Facility Base
MSA	Munitions Storage Area
MTR	Military Training Route
MU	Management Unit
NAS	Naval Air Station
NEPA	National Environmental Policy Act
NHPA	National Historic Preservation Act of 1966
NM	Nautical Mile
NO_x	Nitrogen Oxide
OSHA	Occupational Safety and Health Administration
PAA	Primary Aerospace Vehicle Authorized (formerly Primary Authorized Aircraft)
PIAF	Practice Instrument Approach Fields
PM	Particulate Matter
PM_{10}	Particulate Matter with a Diameter Less Than or Equal to 10 Microns
RCRA	Resource Conservation and Recovery Act
RCW	Red-cockaded Woodpecker
ROD	Record of Decision
ROI	Region of Influence
RW	Runway
SEIS	Supplemental Environmental Impact Statement
SHPO	State Historic Preservation Officer
SO_2	Sulfur Dioxide
SO_x	Sulfur Oxides
SQ	Squadron
Sqd Ops/AMU	Squadron Operations/Aircraft Maintenance Unit
STOVL	Short Take-Off Vertical Landing
SUA	Special Use Airspace
T&E	Threatened and Endangered
TA	Test Area
TP	Target Practice
TRI	Toxic Release Inventory
TSM	Transportation System Management
U.S.	United States
USC	United States Code
USDA	United States Department of Agriculture
USEPA	U.S. Environmental Protection Agency
USFWS	U.S. Fish and Wildlife Service
VOCs	Volatile Organic Compounds

Questions regarding this document should be directed to **Mr. Mike Spaits, Eglin AFB Public Affairs Office, 96 TW/PA, 101 West D Avenue, Room 238, Eglin AFB, FL 32542-5499**; Mr. Spaits may be reached by telephone at **(850) 882-2836** or email at **spaitsm@eglin.af.mil.**